

CASE NARRATIVE

Monthly Data Gelman Sciences
Project: 1,4-Dioxane Remediation
Date: March 2022

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition, all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Gelman Sciences Inc. attests to the validity of the laboratory data generated by Gelman Sciences Ann Arbor, Michigan Environmental Laboratory facilities reported herein. All analyses performed by Gelman Science's Environmental Laboratory facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Gelman Science's Environmental group has reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

At the end of the month some of the 1,4-dioxane samples were sent to Ann Arbor Technical Services for analysis due to a reproducibility problem. The balance of the samples was analyzed for 1,4-dioxane at Gelman Science's Environmental Laboratory. All bromate samples were analyzed by Gelman Science's Environmental Laboratory. The test results in this report meet all NELAP requirements for parameters for which accreditation are required or available. Any exceptions to NELAP requirements are noted in this report. All exceptions are noted per laboratory standard operating procedure based on EPA Method 1624c. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results. The odd even rule is used for rounding. Holding times were met for all samples analyzed. Proper preservation was observed on all samples unless otherwise detailed in the individual sections below. Samples MW-54d, 72d, and 71 were recollected due to questionable results.

RECEIPT/ STORAGE

The samples were received on the days noted in the report for the Month; the samples arrived in good condition, properly preserved and on ice when necessary. Samples that require 1,4-dioxane analysis are collected in hydrochloric HCl acid-preserved vials to a pH of ≤ 2 , except for the Pall ozone treatment samples. These samples have chemicals that, when mixed with the HCl acid, cause interferences and trap damage. Every attempt is made to analyze these samples within 24 hours of receipt.

Samples that require Bromate analysis are collected and preserved in the laboratory with ethylene di-amine and refrigerated.

Samples that are delivered to the laboratory the same day as they are collected are likely not to have reached a fully chilled temperature. This is acceptable as long as there is evidence that chilling has begun. All samples are iced or refrigerated at 4°C ($\pm 2^\circ\text{C}$) from the time of collection until sample preparation or analysis.

1,4-Dioxane (GC-MS)

All ground water and treated water samples were analyzed for 1,4-Dioxane (GC-MS) in accordance with EPA 1624C, which has been modified to enhance detection limits. Samples that were diluted to bring them within the calibrated range of the instrument are noted with a "D" under the Qualifier Code section of the data report. Reporting limits were adjusted based on each dilution.

Reporting limit for undiluted samples is 1ppb (part per billion, micrograms per liter, µg/L). All quality control parameters were within the acceptance limits for reported samples unless indicated.

Bromate (Ion Chromatography)

All surface water and treated samples were analyzed for Bromate (Ion Chromatography) in accordance with EPA 300.1. Surrogates are added to all samples. All quality control parameters were within the acceptance limits with the balance of sample analyzed.

The reporting limit for treated samples is 5.0ppb and for surface samples is 2.0ppb.

Qualifiers

1,4-Dioxane Qualifier Codes:

<i>Qualifier Code</i>	<i>Description</i>
nd:	The compound was analyzed for, but not detected at or above the detection limit indicated.
D:	Analyte value quantified from a dilution; reporting limit is raised to reflect dilution.
E:	The compound result is greater than the upper quantitation limit in the associated calibration curve, reported as estimate.
B:	The sample vials contained air bubbles larger than 5mm, which may affect compound results.
J:	The compound was positively identified; the associated numerical value is the approximate concentration.
M:	Matrix effects, sample required dilution.
R:	The reported value is unusable and rejected due to variance from quality control criteria.
V:	The reported value is considered estimated due to variance from quality control criteria.
H:	Sample was analyzed past 14-day hold time, but within 45 days.
O:	Samples analyzed in outside laboratory.
S:	Samples split with DEQ.

Bromate Qualifier Codes:

<i>Qualifier Code</i>	<i>Description</i>
nd:	The compound was analyzed but was not detected at or above the detection limit indicated.
E:	The compound result is greater than the upper quantitation limit in the associated calibration curve.
J:	The compound was positively identified; the associated numerical value is the approximate concentration.
R:	The reported value is unusable and rejected due to variance from quality control criteria.
V:	The reported value is considered estimated due to variance from quality control criteria.
H:	Sample was analyzed past 28-day hold time

Analyst: Gage M. Trendel  Date: 4/9/22

Report Checked by: Ray Woods  Date: 4/8/22

Sample Analysis Report

March, 2022

642 South Wagner Road
Ann Arbor, MI 48103-9019 US
734.436.4025 phone

Analyst Initials: GHT
Date: 4/8/22

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
Residential Wells								
D0								
5005 Jackson Rd-03-29-22-12:00-1	16	1.0						O
Not Determined								
697 South Wagner Rd-03-31-22-11:40-1	nd	1.0						O
Extraction Wells								
C3								
DOLPH-03-16-22-11:25-1	150	5						O,D
TW-10-03-16-22-11:00-1	910	10						O,D
TW-14-03-16-22-10:35-1	130	5						O,D
TW-20-03-16-22-11:15-1	750	10						O,D
TW-24-03-16-22-11:30-1	2500	40						O,D
D2								
LB-4-03-16-22-09:50-1	490	10						O,D
TW-21-03-16-22-12:00-1	280	10						O,D
E								
TW-17-03-16-22-10:40-1	54	5						O,D
TW-18-03-16-22-12:10-1	260	10						O,D
TW-23-03-16-22-09:55-1	410	10						O,D
TW-29-03-16-22-10:10-1	440	10						O,D

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
Marshy								
PW-1-03-16-22-11:20-1	1000	20						O,D
SW								
TW-22-03-16-22-11:05-1	500	10						O,D
TW-28-03-16-22-11:10-1	680	10						O,D
Monitoring Wells								
C3								
MW-125-03-10-22-12:20-1	220	10						O,D
MW-127s-03-10-22-10:39-1	nd	1.0						O
MW-128s-03-11-22-14:00-1	2	1.0						O
MW-144s-03-03-22-12:40-1	nd	1.0						O
MW-20-03-07-22-12:39-1	nd	1.0						O
MW-22-03-18-22-13:30-1	2000	40						O,D
MW-28-03-22-22-10:45-1	nd	1.0						O
MW-2d-03-09-22-09:15-1	39	1.0						O
MW-37-03-10-22-14:21-1	280	10						O,D
MW-39s-03-17-22-11:02-1	3	1.0						O
D0								
MW-143s-03-03-22-09:21-1	nd	1.0						O
MW-145s-03-09-22-11:05-1	nd	1.0						O
MW-146-03-03-22-10:44-1	nd	1.0						O
MW-51-03-11-22-08:15-1	nd	1.0						O
MW-53d-03-14-22-09:24-1	nd	1.0						O
MW-53i-03-14-22-11:50-1	39	1.0						O
MW-53s-03-14-22-10:36-1	nd	1.0						O
MW-93-03-22-22-12:30-1	nd	1.0						O

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
D2								
465 Dupont-03-17-22-14:41-1	680	20						O,D
MW-122s-03-07-22-11:07-1	330	5						O,D
MW-126s-03-16-22-10:46-1	nd	1.0						O
MW-131s-03-11-22-11:00-1	nd	1.0						O
MW-17-03-29-22-09:07-1	250	20						O,D
MW-39d-03-17-22-12:22-1	21	1.0						O
MW-56s-03-22-22-10:10-1	65	1.0						O
MW-94s-03-29-22-10:36-1	740	20						O,D
MW-BE-1d-03-04-22-12:33-1	530	10						O,D
MW-BE-1s-03-03-22-14:10-	600	10						O,D
E								
373 Pinewood Deep-03-21-22-11:30-1	nd	1.0						O
MW-100-03-18-22-11:11-1	2500	40						O,D
MW-103s-03-15-22-14:35-1	89	1.0						O
MW-112d-03-15-22-13:15-1	2	1.0						O
MW-112i-03-15-22-12:02-1	10	1.0						O
MW-112s-03-15-22-10:53-1	4	1.0						O
MW-122d-03-07-22-09:52-1	nd	1.0						O
MW-126d-03-16-22-09:37-1	nd	1.0						O
MW-127d-03-10-22-09:26-1	nd	1.0						O
MW-128d-03-11-22-12:45-1	nd	1.0						O
MW-131d-03-11-22-09:35-1	nd	1.0						O
MW-135-03-21-22-09:52-1	nd	1.0						O
MW-144d-03-03-22-15:08-1	nd	1.0						O
MW-144i-03-03-22-13:51-1	nd	1.0						O
MW-145d-03-09-22-12:22-1	nd	1.0						O

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
MW-145i-03-09-22-13:37-1	nd	1.0						O
MW-30d-03-04-22-09:30-	100	5						O,D
MW-56d-03-22-22-09:00-1	nd	1.0						O
MW-72d-03-04-22-11:10-	620	10						O,D
MW-76i-03-16-22-12:12-1	130	5						O,D
MW-76s-03-16-22-14:04-1	290	10						O,D
MW-84s-03-14-22-14:02-1	470	10						O,D
Marshy								
NMW-1s-03-28-22-13:15-1	1900	40						O,D
NMW-2s-03-28-22-13:30-1	1900	40						O,D
SH								
MW-25s-03-31-22-08:25-1	130	20						O,D
MW-2s-03-09-22-09:13-1	nd	1.0						O
MW-5d-03-31-22-08:45-1	5300	80						O,D
Surface Water								
Not Applicable								
HC/HR-03-01-22-09:30-1				nd	2.0			
HC/HR-03-02-22-09:10-1				nd	2.0			
HC/HR-03-03-22-11:00-1				nd	2.0			
HC/HR-03-04-22-10:10-				nd	2.0			
HC/HR-03-07-22-09:10-1				nd	2.0			
HC/HR-03-08-22-10:30-1				nd	2.0			
HC/HR-03-09-22-10:10-1				nd	2.0			
HC/HR-03-10-22-10:00-1				nd	2.0			
HC/HR-03-11-22-09:45-1				nd	2.0			
HC/HR-03-14-22-10:00-1				nd	2.0			

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
HC/HR-03-15-22-09:50-1			nd	2.0				
HC/HR-03-16-22-09:25-1			nd	2.0				
HC/HR-03-17-22-10:00-1			nd	2.0				
HC/HR-03-18-22-09:20-1			nd	2.0				
HC/HR-03-21-22-09:40-1			nd	2.0				
HC/HR-03-22-22-11:10-1			nd	5.0				
HC/HR-03-23-22-10:35-1			nd	2.0				
HC/HR-03-24-22-10:10-1			nd	2.0				
HC/HR-03-25-22-10:00-1			nd	2.0				
HC/HR-03-28-22-08:30-1			nd	2.0				
HC/HR-03-29-22-09:40-1			nd	2.0				
HC/HR-03-30-22-06:50-1			nd	2.0				

Treatment System

OUTFALL-03-01-22-1			6.8	5.0				
OUTFALL-03-01-22-2	5	1.0						O
OUTFALL-03-02-22-1	6	1.0						O
OUTFALL-03-02-22-2			11	5.0				
OUTFALL-03-03-22-			10	5.0				
OUTFALL-03-03-22-3	6	1.0						O,D
OUTFALL-03-06-22-2			7.6	5.0				
OUTFALL-03-06-22-1	6	1.0						O
OUTFALL-03-07-22-2			10	5.0				
OUTFALL-03-07-22-1	6	1.0						O
OUTFALL-03-08-22-2			8.8	5.0				
OUTFALL-03-08-22-1	6	1.0						O
OUTFALL-03-09-22-2			8.6	5.0				
OUTFALL-03-09-22-1	7	1.0						O

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
OUTFALL-03-10-22-2			11	5.0				
OUTFALL-03-10-22-1	6	1.0						O
OUTFALL-03-13-22-2			8.6	5.0				
OUTFALL-03-13-22-1	6	1.0						O
OUTFALL-03-14-22-2			10	5.0				
OUTFALL-03-14-22-1	6	1.0						O
OUTFALL-03-15-22-2			9.2	5.0				
OUTFALL-03-15-22-1	6	1.0						O
OUTFALL-03-16-22-2			9.4	5.0				
OUTFALL-03-16-22-1	6	1.0						O
OUTFALL-03-17-22-2			8.6	5.0				
OUTFALL-03-17-22-1	6	1.0						O
OUTFALL-03-20-22-2			7.6	5.0				
OUTFALL-03-20-22-1	6	1.0						O
OUTFALL-03-21-22-2			9.6	5.0				
OUTFALL-03-21-22-1	6	1.0						O
OUTFALL-03-22-22-2			8.5	5.0				
OUTFALL-03-22-22-1	6	1.0						O
OUTFALL-03-23-22-2			8.9	5.0				
OUTFALL-03-23-22-1	6	1.0						O
OUTFALL-03-24-22-2			11	5.0				
OUTFALL-03-24-22-1	7	1.0						O
OUTFALL-03-27-22-2			8.6	5.0				
OUTFALL-03-27-22-1	6	1.0						O
OUTFALL-03-28-22-2			11	5.0				
OUTFALL-03-28-22-1	6	1.0						O
OUTFALL-03-29-22-2			9.6	5.0				

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
OUTFALL-03-29-22-1	6	1.0						O
OUTFALL-03-31-22-2			5.2	5.0				
OUTFALL-03-31-22-1	8	1.0						O
Red Pond-03-01-22-07:30-1	460	40						O,D
Red Pond-03-02-22-07:25-1	440	40						O,D
Red Pond-03-03-22-07:35-1	440	40						O,D
Red Pond-03-04-22-07:35-	520	40						O,D
Red Pond-03-07-22-07:30-1	460	40						O,D
Red Pond-03-08-22-07:45-1	510	40						O,D
Red Pond-03-09-22-07:55-1	440	40						O,D
Red Pond-03-10-22-07:30-1	430	10						O,D
Red Pond-03-11-22-07:20-1	440	40						O,D
Red Pond-03-14-22-07:45-1	430	40						O,D
Red Pond-03-15-22-07:10-1	460	40						O,D
Red Pond-03-16-22-07:35-1	420	40						O,D
Red Pond-03-17-22-07:35-1	470	40						O,D
Red Pond-03-18-22-07:00-1	470	40						O,D
Red Pond-03-21-22-07:15-1	440	40						O,D
Red Pond-03-22-22-07:35-1	440	10						O,D
Red Pond-03-23-22-07:40-1	460	40						O,D
Red Pond-03-24-22-07:00-1	420	40						O,D
Red Pond-03-28-22-07:05-1	420	40						O,D
Red Pond-03-29-22-07:00-1	430	40						O,D
Red Pond-03-30-22-06:30-1	370	10						O,D
Red Pond-03-31-22-15:25-1	520	10						O,D

Data Transmittal Cover Page

Project Name: Pall Corporation
 ATS Project Number: G001-002
 ATS Report Number(s): Inorg_SRF_0314221
 Client PO Number: 4505179649
 Project Description: This data report contains the results of 13 water samples, received by ATS on March 14, 2002 to be analyzed for 1,4-Dioxane.

We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratory, as required by USEPA. Laboratory data sheets, SOPs, and QA/QC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.



LABORATORY OPERATIONS
CASE NARRATIVE

ATS Project Number: G001-002
 Report Date: 3/21/02
 SRF / SDG Number(s): 0314221
 Client PO Number: 4505179649

ORGANIC ANALYSIS
1,4-Dioxane by GC/MS
USEPA 1624

Case Narrative Summary

This case narrative applies to the following 13 samples that were received at Ann Arbor Technical Services, Inc. (ATS) on 3/14/02, and associated matrix-specific QA/QC.

Client Sample Identification	Sample Date	Requested Turn Around Time	Analysis	Matrix
Received: 01452				
Char[01] 001	3/13/02	Urgent	1,4-Dioxane	Water
Red Pond	3/14/02	Urgent	1,4-Dioxane	Water
Combustion Effluent	3/14/02	Urgent	1,4-Dioxane	Water
FFOC-1a	3/14/02	Urgent	1,4-Dioxane	Water
FFOC-2a	3/14/02	Urgent	1,4-Dioxane	Water
IP3	3/14/02	Urgent	1,4-Dioxane	Water
Outfall 05b	3/14/02	Urgent	1,4-Dioxane	Water
Outfall 10a	3/14/02	Urgent	1,4-Dioxane	Water
MW-11	3/11/02	Standard	1,4-Dioxane	Water
MW-131b	3/11/02	Standard	1,4-Dioxane	Water
MW-131c	3/11/02	Standard	1,4-Dioxane	Water
MW-128a	3/11/02	Standard	1,4-Dioxane	Water
MW-128b	3/11/02	Standard	1,4-Dioxane	Water

Upon receipt samples were scheduled for the following analyses.

- Analysis: 1,4-Dioxane (USEPA 1624) - Urgent TAT
 1,4-Dioxane (USEPA 1624) - Standard TAT
 Number of Samples: 1 Matrix Spike + 1 Matrix Spike Duplicate
 3 Samples

G001-002-22-CN_0314221.dwg

Consultants in Chemistry & Environmental Science
 290 South Wagner Road, Ann Arbor, Michigan 48103 Tel 734/995-0095 Fax 734/995-3731

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample conditions and anomalies, if any, are either presented in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exceptions:

- None

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written standard operating procedure (SOP) specific to the ATS Laboratory, as required by USEPA. All data are peer and management reviewed to ensure compliance with the above referenced SOP's and project specifications. In addition, all data conform to the Laboratory's Quality Assurance / Quality Control Manual.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LRB), fortified blanks (FB, LFB, LCS), matrix spikes (MS, SPK), and duplicates whether spiked or native (MSD, SPK, DUP, DUP, LR).

Data Deliverables

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, IFA RS EDD) are available upon request. There were no hierarchy data summary sheets generated for this project.

Sample Analysis

1,4-Dioxane Analysis (GC/MS): Samples were analyzed by purge and trap GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography - Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 1,4-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as ngl.

Analyses Performed

None

Analytical QA/QC Summary

Calibration Verification

Method calibration was verified through the analysis of a mid-level initial calibration verification (CV) standard at a frequency of every 12 hours. All verification standards met the acceptance criteria with the following exceptions:

- None

Instrument Blanks

Low system background was demonstrated through the analysis of instrument blanks at a minimum of every 12 hours. All instrument blanks met the acceptance criteria with the following exceptions:

- None

G001-002-22-CN_0314221.dwg



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ATS Project Number: G001-002.22
 ATS SDG: 0314221

Prepared By:
 Ann Arbor Technical Services, Inc.
 290 South Wagner Road
 Ann Arbor, MI 48103

QA/QC Batch Summary

Internal Standards

Internal standards stress and retention times met the acceptance criteria with the following exceptions:

- None

Laboratory Reagent Blanks

A laboratory reagent blank (LRB) was analyzed with each QA/QC batch. The LRB's met the acceptance criteria with the following exceptions:

- None

Laboratory Fortified Blanks / Laboratory Control Samples

A laboratory fortified blank (LFB) was analyzed with each QA/QC batch. The LFB's met the acceptance criteria with the following exceptions:

- None

Matrix Spikes and Spike Duplicates

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed with each QA/QC batch. The MS/MSD's met the acceptance criteria with the following exceptions:

Lab Sample ID	Concentration	Percent Recovery	Acceptance Limits
0314221-2 MS	1,4-Dioxane	124	80-120%
0314221-2 MSD	1,4-Dioxane	122	80-120%

Matrix Replicates

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed with each QA/QC batch. The replicates met the acceptance criteria with the following exceptions:

- None

Sample Dilutions

Samples containing compounds at concentrations above the initial calibration curve were diluted and reanalyzed for those compounds. The following samples were diluted for 1,4-Dioxane:

- Red Pond 3/14/02

/ March 21, 2002

Mark T. DeLong (Quality Assurance Coordinator)

/ March 21, 2002

Philip H. Simon (Laboratory Director)

Requested Turn Around Time Priority/Number Key: 1=Urgent, 2= Rush, 3=Standard

Lab Sample ID	Client Sample ID	Sample Date	Requested Turn Around Time	Priority/Number Key	Analysis	Matrix	Number of Samples	Matrix Spike	Matrix Spike Duplicate	Number of Samples	Matrix Spike	Matrix Spike Duplicate
0314221-001	Char[01] 001	3/13/02	Urgent	1	1,4-Dioxane	Water	1	1	1	1	1	1
0314221-002	Red Pond	3/14/02	Urgent	1	1,4-Dioxane	Water	1	1	1	1	1	1
0314221-003	Combustion Effluent	3/14/02	Urgent	1	1,4-Dioxane	Water	1	1	1	1	1	1
0314221-004	FFOC-1a	3/14/02	Urgent	1	1,4-Dioxane	Water	1	1	1	1	1	1
0314221-005	FFOC-2a	3/14/02	Urgent	1	1,4-Dioxane	Water	1	1	1	1	1	1
0314221-006	IP3	3/14/02	Urgent	1	1,4-Dioxane	Water	1	1	1	1	1	1
0314221-007	Outfall 05b	3/14/02	Urgent	1	1,4-Dioxane	Water	1	1	1	1	1	1
0314221-008	Outfall 10a	3/14/02	Urgent	1	1,4-Dioxane	Water	1	1	1	1	1	1
0314221-009	MW-11	3/11/02	Standard	3	1,4-Dioxane	Water	1	1	1	1	1	1
0314221-010	MW-131b	3/11/02	Standard	3	1,4-Dioxane	Water	1	1	1	1	1	1
0314221-011	MW-131c	3/11/02	Standard	3	1,4-Dioxane	Water	1	1	1	1	1	1
0314221-012	MW-128a	3/11/02	Standard	3	1,4-Dioxane	Water	1	1	1	1	1	1
0314221-013	MW-128b	3/11/02	Standard	3	1,4-Dioxane	Water	1	1	1	1	1	1

CHAIN OF CUSTODY RECORD

G001-002-22-CN_0314221.dwg



G001-002-22-CN_0314221.dwg





ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY BLANK SUMMARY

Method: USEPA 1631
QA/QC Batch Number: QOC0311221
SOP: 031021
Project Number: 001-002.23
Report Date: 3/1/2022

Table with 7 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, PPM, UCL, Method Detection Limit, Reporting Detection Limit, and Quota. Row 1: LFB 1-1532, 03/01/2022, 11:33:27, 1,4-Dioxane, 123-91-1, 0.01, 0.01.

Comments: 2 of 4 matrix spike duplicate (MSD) were used. 2 of 4 matrix spike duplicate (MSD) were used. 2 of 4 matrix spike duplicate (MSD) were used.



CHAIN OF CUSTODY RECORD

Chain of Custody Record table with columns for Sample ID, Date, Time, Location, and Analyst. Includes handwritten entries for sample collection and analysis.

* Requested Turn-Around Time Priority Number Key: 1 = Urgent 2 = Rush 3 = Standard

Sample Identification: Samples containing components at concentrations above the initial calibration curve were diluted and reanalyzed for all components. The following samples were diluted for all components: MW-04-31-022

Mark T. DeLong (Quality Assurance Coordinator)
Philip H. Swann (Laboratory Director)



QA/QC Batch Summary: Internal standards were and retention times met the acceptance criteria with the following exceptions: None.

Laboratory Fortified Blank (LFB) was analyzed with each QA/QC batch. The LFBs met the acceptance criteria with the following exceptions: None.

Laboratory Control Sample (LCS) / On-Going Precision and Accuracy (OPR): Matrix Spike Duplicate (MSD) was analyzed with each QA/QC batch. The MSDs met the acceptance criteria with the following exceptions: None.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY PRECISION SUMMARY

Method: USEPA 1631
QA/QC Batch Number: QOC0311221
SOP: 031021
Project Number: 001-002.23
Report Date: 3/1/2022

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, PPM, Mean, UCL, LCL, and Quota. Row 1: 031021-1-1631, 03/01/2022, 10:34:00, 1,4-Dioxane, 123-91-1, 1.32, 1.36, 1.34, 0.04, 2.00, 23.

Comments: 2 of 4 matrix spike duplicate (MSD) were used. 2 of 4 matrix spike duplicate (MSD) were used. 2 of 4 matrix spike duplicate (MSD) were used.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method: USEPA 1631
QA/QC Batch Number: QOC0311221
SOP: 031021
Project Number: 001-002.23
Report Date: 3/1/2022

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, UCL, LCL, and Quota. Row 1: 031021-1-1631, 03/01/2022, 10:34:00, 1,4-Dioxane, 123-91-1, 0.40, 0.80, 1.20, 0.04, 0.10, 0.10.

Comments: 2 of 4 matrix spike duplicate (MSD) were used. 2 of 4 matrix spike duplicate (MSD) were used. 2 of 4 matrix spike duplicate (MSD) were used.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method: USEPA 1631
QA/QC Batch Number: QOC0311221
SOP: 031021
Project Number: 001-002.23
Report Date: 3/1/2022

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, UCL, LCL, and Quota. Row 1: 031021-1-1631, 03/01/2022, 10:34:00, 1,4-Dioxane, 123-91-1, 0.40, 0.80, 1.20, 0.04, 0.10, 0.10.

Comments: 2 of 4 matrix spike duplicate (MSD) were used. 2 of 4 matrix spike duplicate (MSD) were used. 2 of 4 matrix spike duplicate (MSD) were used.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method: USEPA 1631
QA/QC Batch Number: QOC0311221
SOP: 031021
Project Number: 001-002.23
Report Date: 3/1/2022

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, UCL, LCL, and Quota. Row 1: LFB 1-1532, 03/01/2022, 10:34:00, 1,4-Dioxane, 123-91-1, 0.40, 0.80, 1.20, 0.04, 0.10, 0.10.

Comments: 2 of 4 matrix spike duplicate (MSD) were used. 2 of 4 matrix spike duplicate (MSD) were used. 2 of 4 matrix spike duplicate (MSD) were used.

Data Transmittal Cover Page

Project Name: Pall Corporation
 ATS Project Number: G001-002
 ATS Report Number(s): Inorg_SRF_0316221
 Client PO Number: 4505179649
 Project Description: This data report contains the results of 12 water samples, received by ATSD on March 16, 2022 to be analyzed for 1,4-Dioxane.

We certify that the sample analysis for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATSL Laboratory, as required by USEPA. Laboratory data sheets, SOPs, and QA/QC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Gage Trendel Email: gage_trendel@pall.com
 FAX Number:
 No. of Pages (including cover pg.): 27
 From: Sarah Stubbelfield Email: Sarah.Stubbelfield@AnnArborTechnicalServices.com
 Sewer Chemist / Lab Manager FAX Number: 734-995-3721

Additional Message: Copy report to: Patterson, Keith (keith.patterson@pall.com), Brode, Jim (jim.brode@pall.com)
 Katie Strohmeier (katiestrohmeier@veeng.com), neodus@ve-eng.com, Patern, Sue Patern (sue.patern@pall.com)
 Armande Isabella (armande.isabella@pall.com)

Date: 3/21/22 Signed:

IF YOU DO NOT RECEIVE ALL PAGES OF THIS TRANSMITTAL, PLEASE CALL 734-995-0995.

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ORGANIC ANALYSIS
1,4-Dioxane by GC/MS
USEPA 1624

ATS Project Number: G001-002.22

ATS SDG: 0316221

Prepared By:
 Ann Arbor Technical Services, Inc.
 290 South Wagner Road
 Ann Arbor, MI 48103

LABORATORY OPERATIONS
CASE NARRATIVE

ATS Project Number: G001-002
 Report Date: 3/21/22
 SRF / SDG Number(s): 0316221
 Client PO Number: 4505179649

Case Narrative Summary

This case narrative applies to the following 12 samples that were received at Ann Arbor Technical Services, Inc. (ATSL) on 3/16/22, and associated matrix-specific QA/QC.

Client Sample Identification	Sample Date	Requested Turn Around Time	Analysis	Matrix
ATSL#01-001	3/16/22	Urgent	1,4-Dioxane	Water
Red Pond	3/16/22	Urgent	1,4-Dioxane	Water
Combustion Effluent	3/16/22	Urgent	1,4-Dioxane	Water
EFF-OC-1a	3/16/22	Urgent	1,4-Dioxane	Water
EFF-OC-2a	3/16/22	Urgent	1,4-Dioxane	Water
SR-1	3/16/22	Urgent	1,4-Dioxane	Water
Charfil Creek	3/16/22	Urgent	1,4-Dioxane	Water
Charfil Trer	3/16/22	Urgent	1,4-Dioxane	Water
MW-112a	3/16/22	Standard	1,4-Dioxane	Water
MW-112b	3/16/22	Standard	1,4-Dioxane	Water
MW-113	3/16/22	Standard	1,4-Dioxane	Water
MW-187a	3/16/22	Standard	1,4-Dioxane	Water

Urgent receipt requests were scheduled for the following analyses.

Analysis	Number of Samples
1,4-Dioxane (USEPA 1624) - Urgent TAT	8 Samples + 1 Matrix Spike + 1 Matrix Spike Duplicate
1,4-Dioxane (USEPA 1624) - Standard TAT	4 Samples

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Counselors in Chemistry & Environmental Science
 290 South Wagner Road, Ann Arbor, Michigan 48103 Tel 734-995-0995 Fax 734-995-3721

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATSL by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample conditions and anomalies, if any, are either presented in the "Sample Issues" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exceptions:

- None

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written standard operating procedure (SOP) specific to the ATSL Laboratory, as required by USEPA. All data are peer and management reviewed to ensure compliance with the above referenced SOP and project specifications. In addition, all data conforms to the Laboratory's Quality Assurance / Quality Control Manual.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (ML, LMB), fortified blanks (BS, LFB, LCB), matrix spikes (MS, SPK), and duplicates whether spiked or native (MSD, SPK DUP, LFB, LJC).

Data Deliverables

This data package contains a Level II package; other data report packages (Level I, Level IV DVP, EPA R5 EDQ) are available upon request. There were no laboratory data summary sheets generated for this project.

Sample Analysis

1,4-Dioxane Analysis (GC/MS): Samples were analyzed by purge and trap GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Sorptive Desorption Gas Chromatography - Mass Spectrometry). An initial calibration with at least five levels was used to quantify 1,4-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as ug/L.

Analysis Method

None

Analytical QA/QC Summary

Calibration Verification

Method calibration was verified through the analysis of a mid-level initial calibration verification (CV) standard at a frequency of every 12 hours. All verification standards met the acceptance criteria with the following exceptions:

- None

Low system background was demonstrated through the analysis of instrument blanks at a minimum of every 12 hours. All instrument blanks met the acceptance criteria with the following exceptions:

- None

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QA/QC Batch Summary

Internal Standards

Internal standards accuracy and retention times met the acceptance criteria with the following exceptions:

- None

Laboratory Reagent Blanks

A laboratory reagent blank (LRB) was analyzed with each QA/QC batch. The LRB's met the acceptance criteria with the following exceptions:

- None

Laboratory Fortified Blanks / Laboratory Control Samples

A laboratory fortified blank (LFB) was analyzed with each QA/QC batch. The LFB's met the acceptance criteria with the following exceptions:

- None

Matrix Spikes and Spike Duplicates

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed with each QA/QC batch. The MS/MSD's met the acceptance criteria with the following exceptions:

Lab Sample ID	Component	Percent Recovery	Acceptance Limits
0316221-2_MSD	1,4-Dioxane	121	80-120%

Matrix Replicates

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed with each QA/QC batch. The replicates met the acceptance criteria with the following exceptions:

- None

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Sample Dilutions

Samples containing compounds at concentrations above the initial calibration curve were diluted and reanalyzed for those compounds. The following samples were diluted for 1,4-Dioxane:

- Red Pond 3/16/22

/ March 21, 2022

Mark T. DeLong (Quality Assurance Coordinator)

/ March 21, 2022
 Philip B. Simms (Laboratory Director)

0001-002.22CN_0316221.doc

Requested Turn-Around Time Priority Number Key: 1 = Urgent, 2 = Rush, 3 = Standard

Client Sample ID	Sample Date	Requested Turn Around Time	Analysis	Matrix	Lab Sample ID	Component	Percent Recovery	Acceptance Limits
ATSL#01-001	3/16/22	Urgent	1,4-Dioxane	Water				
Red Pond	3/16/22	Urgent	1,4-Dioxane	Water				
Combustion Effluent	3/16/22	Urgent	1,4-Dioxane	Water				
EFF-OC-1a	3/16/22	Urgent	1,4-Dioxane	Water				
EFF-OC-2a	3/16/22	Urgent	1,4-Dioxane	Water				
SR-1	3/16/22	Urgent	1,4-Dioxane	Water				
Charfil Creek	3/16/22	Urgent	1,4-Dioxane	Water				
Charfil Trer	3/16/22	Urgent	1,4-Dioxane	Water				
MW-112a	3/16/22	Standard	1,4-Dioxane	Water				
MW-112b	3/16/22	Standard	1,4-Dioxane	Water				
MW-113	3/16/22	Standard	1,4-Dioxane	Water				
MW-187a	3/16/22	Standard	1,4-Dioxane	Water				

CHAIN OF CUSTODY RECORD

Jim Bradley
 From: Trendel, Gage <gage_trendel@pall.com>
 Sent: Wednesday, March 16, 2022 9:03 AM
 To: Jim Bradley, Sarah Stubbelfield, Mark DeLong
 Cc: David Stubbelfield
 Subject: RE: Pall cCOC 3/16/2022

Yes. Lets use the vial time.
Gage Trendel
 Chemist
 K&V OPERATIONS AND RESOURCE MANAGEMENT, INC.
 642 S. Wagner Road | Ann Arbor | MI | 48103
 C: 616.977.1000 | D: 419.787.5144 | F: 616.977.1005

From: Jim Bradley <jim.bradley@annarbortechservices.com>
 Sent: Wednesday, March 16, 2022 9:03 AM
 To: Trendel, Gage <gage_trendel@pall.com>; Sarah Stubbelfield <Sarah.Stubbelfield@annarbortechservices.com>; Mark DeLong <Mark.DeLong@annarbortechservices.com>
 Cc: David Stubbelfield <David.Stubbelfield@annarbortechservices.com>
 Subject: RE: Pall cCOC 3/16/2022

Gage,
 The times for samples 10 and 11 are reversed on the CDC. Would you like to go with the vial times or the CDC times for these?

Jim
 From: Trendel, Gage <gage_trendel@pall.com>
 Sent: Wednesday, March 16, 2022 8:15 AM
 To: Sarah Stubbelfield <Sarah.Stubbelfield@annarbortechservices.com>; Mark DeLong <Mark.DeLong@annarbortechservices.com>
 Cc: David Stubbelfield <David.Stubbelfield@annarbortechservices.com>; Jim Bradley <jim.bradley@annarbortechservices.com>
 Subject: Pall cCOC 3/16/2022

Gage Trendel
 Chemist
 K&V OPERATIONS AND RESOURCE MANAGEMENT, INC.
 642 S. Wagner Road | Ann Arbor | MI | 48103
 C: 616.977.1000 | D: 419.787.5144 | F: 616.977.1005



ORGANIC ANALYSIS
1,4-Dioxane by GC/MS
USEPA 1624

ATS Project Number: G001-002
Report Date: 3/21/22
SRF / SDG Number(s): 0317221a/b
Client PO Number: 4505179649

Case Narrative Summary

This case narrative applies to the following 24 samples that were received at Ann Arbor Technical Services, Inc. (ATS) on 3/17/22, and associated matrix-specific QA/QC:

Table with columns: Client Sample Identification, Sample Date, Requested Turn-Around Time, Analysis, Matrix. Lists 24 samples including Red Pond, Combustion Effluent, and various TW and MW samples.

001-002-22-CN-0317221a/b.doc
Consultants in Chemistry & Environmental Science
290 South Wagner Road, Ann Arbor, Michigan 48103 | Tel: 734/995-2000 Fax: 734/995-3731

ATS Project Number: G001-002.22
ATS SDG: 0317221a/b

Prepared By:
Ann Arbor Technical Services, Inc.
290 South Wagner Road
Ann Arbor, MI 48103

Upon receipt samples were scheduled for the following analyses.

- Analysis: 1,4-Dioxane (USEPA 1624) - Urgent TAT, 1,4-Dioxane (USEPA 1624) - Standard TAT
Number of Samples: 6 Samples + 3 Matrix Spike + 3 Matrix Spike Duplicate, 18 Samples + 3 Matrix Spike + 1 Matrix Spike Duplicate

Sample Receipt, Chain of Custody Records, and Holdline Times

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample conditions and anomalies, if any, are either presented in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exceptions:

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written standard operating procedure (SOP) specific to the ATS Laboratory, as required by USEPA. All data are peer and management reviewed to ensure compliance with the above referenced SOP's and project specifications. In addition, all data conform to the Laboratory's Quality Assurance / Quality Control Manual.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LRB), fortified blanks (BS, LFB, LCS), matrix spikes (MS, SPC), and duplicates (whether spiked or native) (MSD, SPK DUP, DUP, LR, LRS).

Data Deliverables

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA RS EDD) are available upon request. There were no hardcopy data summary sheets generated for this project.

Sample Analysis

1,4-Dioxane Analysis (GC/MS): Samples were analyzed by purge and trap GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Sorbent Tubes Gas Chromatography - Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 1,4-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as n/g/L.

Anomalous Alerts:

- None

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Analytical QA/QC Summary

Calibration Verification

Method calibration was verified through the analysis of a mid-level initial calibration verification (CV) standard at a frequency of every 12 hours. All verification standards met the acceptance criteria with the following exceptions:

Instrument Blanks

Low system background was demonstrated through the analysis of instrument blanks at a minimum of every 12 hours. All instrument blanks met the acceptance criteria with the following exceptions:

QA/QC Batch Summary

Internal Standards

Internal standards areas and retention times met the acceptance criteria with the following exceptions:

Laboratory Reagent Blanks

A laboratory reagent blank (LRB) was analyzed with each QA/QC batch. The LRB's met the acceptance criteria with the following exceptions:

Laboratory Fortified Blanks / Laboratory Control Samples

A laboratory fortified blank (LFB) was analyzed with each QA/QC batch. The LFB's met the acceptance criteria with the following exceptions:

Table with columns: LFB Sample ID, Constituent, Percent Recovery, Acceptance Limits. Shows LFB-2 3/19/22 for 1,4-Dioxane with 117% recovery and 85-115% acceptance limits.

Matrix Spikes and Spike Duplicates

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed with each QA/QC batch. The MS/MSD's met the acceptance criteria with the following exceptions:

Matrix Replicates

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed with each QA/QC batch. The replicates met the acceptance criteria with the following exceptions:

Sample Dilutions

Samples containing compounds at concentrations above the initial calibration curve were diluted and reanalyzed for those compounds. The following samples were diluted for 1,4-Dioxane:

- Red Pond 3/17/22, TW-14 3/16/22, TW-23 3/16/22, TW-28 3/16/22, TW-29 3/16/22, PW-1 3/16/22, TW-18 3/16/22, TW-21 3/16/22, MW-76 3/16/22, LR-4 3/16/22, TW-29 3/16/22, TW-17 3/16/22, TW-28 3/16/22, TW-10 3/16/22, DDLPH1 3/16/22, MW-76 3/16/22, MW-76 3/16/22

Mark T. DeLong / March 21, 2022

Mark T. DeLong (Quality Assurance Coordinator)

Philip H. Simons (Laboratory Director) / March 21, 2022

001-002-22-CN-0317221a/b.doc



Large data table with columns for sample ID, date, and analysis results. Includes handwritten notes and signatures.



CHAIN OF CUSTODY RECORD

Large data table with columns for sample ID, date, and analysis results. Includes handwritten notes and signatures.



CHAIN OF CUSTODY RECORD

Jim Bradley
From: Trendel, Gage <gage_trendel@pall.com>
Sent: Thursday, March 17, 2022 12:53 PM
To: Jim Bradley
Subject: RE: Pall eCOC 3/17/2022

Let's just remove them from the COC then.
Gage Trendel
Chemist
PALL CORPORATION AND RESOURCES MANAGEMENT, INC.
642 S. Wagner Road | Ann Arbor | MI 48103
O: 616.977.1000 | D: 416.787.5144 | F: 616.977.1005

From: Jim Bradley <jim.bradley@annarbortechinc.com>
Sent: Thursday, March 17, 2022 12:52 PM
To: Trendel, Gage <gage_trendel@pall.com>
Subject: RE: Pall eCOC 3/17/2022
They both have the same sample time, 8:00
From: Trendel, Gage <gage_trendel@pall.com>
Sent: Thursday, March 17, 2022 12:48 PM
To: Jim Bradley <jim.bradley@annarbortechinc.com>; Sarah Stubblefield <Sarah.Stubblefield@annarbortechinc.com>; Mark DeLong <Mark.Delong@annarbortechinc.com>; David Stubblefield <David.Stubblefield@annarbortechinc.com>
Subject: RE: Pall eCOC 3/17/2022
Do they have the same time on them? The test would be the later sampled of the two.

Gage Trendel
Chemist
PALL CORPORATION AND RESOURCES MANAGEMENT, INC.
642 S. Wagner Road | Ann Arbor | MI 48103
O: 616.977.1000 | D: 416.787.5144 | F: 616.977.1005

From: Jim Bradley <jim.bradley@annarbortechinc.com>
Sent: Thursday, March 17, 2022 12:03 PM
To: Trendel, Gage <gage_trendel@pall.com>; Sarah Stubblefield <Sarah.Stubblefield@annarbortechinc.com>; Mark DeLong <Mark.Delong@annarbortechinc.com>; David Stubblefield <David.Stubblefield@annarbortechinc.com>
Subject: RE: Pall eCOC 3/17/2022
Gage,



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY BLANK SUMMARY

Method: USEPA 1631
QA/QC Batch Number: G00R0317222
SOS: 0317221a
Project Number: G01-032-22
Report Date: 3/1/2022

Laboratory Reagent Blank (LRB) / Method Blank (MB)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Result, Units, Basis, Method Detection Limit, Reporting Extension Limit, Quarter. Row 1: US-131122, 03/01/2022, 11:52:17, 14-Cuave, 12581-1, ngl, wt, 0.01

Comments: All metals analyzed by EPA method unless otherwise noted. Customer provided spike & target. Project sample using the NCL based upon lower detector activity. All metals analyzed using the listed sample matrix.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY BLANK SUMMARY

Method: USEPA 1631
QA/QC Batch Number: G00R0317221
SOS: 0317221a
Project Number: G01-032-22
Report Date: 3/1/2022

Laboratory Reagent Blank (LRB) / Method Blank (MB)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Result, Units, Basis, Method Detection Limit, Reporting Extension Limit, Quarter. Row 1: US-131122, 03/01/2022, 08:52:23, 14-Cuave, 12581-1, ngl, wt, 0.01

Comments: All metals analyzed by EPA method unless otherwise noted. Customer provided spike & target. Project sample using the NCL based upon lower detector activity. All metals analyzed using the listed sample matrix.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method: USEPA 1631
QA/QC Batch Number: G00R0317222
SOS: 0317221a
Project Number: G01-032-22
Report Date: 3/1/2022

Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS) / On-Going Precision and Accuracy (OPR)

Table with 13 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Basis, Percent Recovery, LCL, UCL, Quarter. Row 1: US-131122, 03/01/2022, 12:14:16, 14-Cuave, 12581-1, 2.01, 0.00, 1.21, ngl, wt, 102, 93, 103

Comments: All metals analyzed by EPA method unless otherwise noted. Customer provided spike & target. Project sample using the NCL based upon lower detector activity. All metals analyzed using the listed sample matrix.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method: USEPA 1631
QA/QC Batch Number: G00R0317221
SOS: 0317221a
Project Number: G01-032-22
Report Date: 3/1/2022

Matrix Spike (MS)

Table with 13 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Basis, Percent Recovery, LCL, UCL, Quarter. Row 1: US-131122, 03/01/2022, 08:52:23, 14-Cuave, 12581-1, 2.01, 0.00, 1.21, ngl, wt, 102, 93, 103

Comments: All metals analyzed by EPA method unless otherwise noted. Customer provided spike & target. Project sample using the NCL based upon lower detector activity. All metals analyzed using the listed sample matrix.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method: USEPA 1631
QA/QC Batch Number: G00R0317221
SOS: 0317221a
Project Number: G01-032-22
Report Date: 3/1/2022

Matrix Spike (MS)

Table with 13 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Basis, Percent Recovery, LCL, UCL, Quarter. Row 1: US-131122, 03/01/2022, 08:52:23, 14-Cuave, 12581-1, 2.01, 0.00, 1.21, ngl, wt, 102, 93, 103

Comments: All metals analyzed by EPA method unless otherwise noted. Customer provided spike & target. Project sample using the NCL based upon lower detector activity. All metals analyzed using the listed sample matrix.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method: USEPA 1631
QA/QC Batch Number: G00R0317221
SOS: 0317221a
Project Number: G01-032-22
Report Date: 3/1/2022

Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS) / On-Going Precision and Accuracy (OPR)

Table with 13 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Basis, Percent Recovery, LCL, UCL, Quarter. Row 1: US-131122, 03/01/2022, 08:14:16, 14-Cuave, 12581-1, 2.01, 0.00, 1.21, ngl, wt, 102, 93, 103

Comments: All metals analyzed by EPA method unless otherwise noted. Customer provided spike & target. Project sample using the NCL based upon lower detector activity. All metals analyzed using the listed sample matrix.

Large table with multiple columns and rows, containing handwritten signatures and data. Columns include Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Result, Units, Basis, Method Detection Limit, Reporting Extension Limit, Quarter.

Just wanted to let you know we received 2 out of 3 test samples and did not receive a total full grab sample. How would you like me to handle this? Thanks Jim

From: "Jim" <jim@annarbortech.com>
Sent: Thursday, March 17, 2022 12:26 PM
To: Sarah Stubbins <Sarah.Stubbins@annarbortech.com>; Mark DeLong <Mark.Delong@annarbortech.com>; Jim Burkey <Jim.Burkey@annarbortech.com>
Subject: FW: eQOC 3/17/2022

Case: Treadel
Client:
C:\A\ORGANIZATION\7378\B\B\ORGANIZATION\MENT\INC
C:\A\ORGANIZATION\7378\B\B\ORGANIZATION\MENT\INC
C:\A\ORGANIZATION\7378\B\B\ORGANIZATION\MENT\INC

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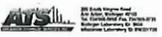
QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY BLANK SUMMARY

Method USEPA 1631
QA/QC Batch Number: 000A0318221
SOS 031821
Project Number: 0001402.22
Report Date: 3/21/22

Laboratory Reagent Blank (LRB) / Method Blank (MB)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Purity, Units, Base, Method Detection Limit, Reporting Detection Limit, Quatifier. Row 1: LFA 1 3/18/22, 05:15:22, 05:11, 1,4-Dioxane, 123-21-1, 99.9, mg/L, Flat, 0.01

Comments: 20 method blanks (MB) & 20 method blanks (MB) were used. All values were below the detection limit. No values were reported for 1,4-Dioxane. All values were below the reporting limit. All values were below the detection limit.



CHAIN OF CUSTODY RECORD

Page 1

Chain of Custody Record table with columns for Sample ID, Date, Time, Location, and various checkboxes for handling and analysis steps.

* - Requested Turn-Around Time Priority Number Key: 1 = Urgent 2 = Rush 3 = Standard

Sample Information: Samples containing compounds at concentrations above the initial calibration curve were diluted and reanalyzed for these compounds. The following samples were diluted for 1,4-Dioxane: 463 Ingest 3/17/22, Red Food 3/17/22. Mark T. DeLone (Quality Assurance Coordinator), Philip D. Jensen (Laboratory Director).



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY PRECISION SUMMARY

Method USEPA 1631
QA/QC Batch Number: 000A0318221
SOS 031821
Project Number: 0001402.22
Report Date: 3/21/22

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Spike Addition, Measured Concentration, Units, Base, Percent Recovery, LCL, UCL, Quatifier. Row 1: 031821-1 MS, 03/18/22, 05:40:28, 1,4-Dioxane, 123-21-1, 1.08, 1.38, mg/L, Flat, 1.00, 22

Comments: 20 method blanks (MB) & 20 method blanks (MB) were used. All values were below the detection limit. No values were reported for 1,4-Dioxane. All values were below the reporting limit. All values were below the detection limit.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method USEPA 1631
QA/QC Batch Number: 000A0318221
SOS 031821
Project Number: 0001402.22
Report Date: 3/21/22

Matrix Spike Duplicate (MSD)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Spike Addition, Measured Concentration, Units, Base, Percent Recovery, LCL, UCL, Quatifier. Row 1: 031821-2 MS, 03/18/22, 05:50:28, 1,4-Dioxane, 123-21-1, 0.472, 0.500, 1.33, mg/L, Flat, 107, 85, 103

Comments: 20 method blanks (MB) & 20 method blanks (MB) were used. All values were below the detection limit. No values were reported for 1,4-Dioxane. All values were below the reporting limit. All values were below the detection limit.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method USEPA 1631
QA/QC Batch Number: 000A0318221
SOS 031821
Project Number: 0001402.22
Report Date: 3/21/22

Matrix Spike (MS)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Spike Addition, Measured Concentration, Units, Base, Percent Recovery, LCL, UCL, Quatifier. Row 1: 031821-3 MS, 03/18/22, 05:40:28, 1,4-Dioxane, 123-21-1, 3.476, 4.800, 1.28, mg/L, Flat, 102, 81, 107

Comments: 20 method blanks (MB) & 20 method blanks (MB) were used. All values were below the detection limit. No values were reported for 1,4-Dioxane. All values were below the reporting limit. All values were below the detection limit.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method USEPA 1631
QA/QC Batch Number: 000A0318221
SOS 031821
Project Number: 0001402.22
Report Date: 3/21/22

Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS) / On-Going Precision and Accuracy (OPR)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Spike Addition, Measured Concentration, Units, Base, Percent Recovery, LCL, UCL, Quatifier. Row 1: LFA 1 3/18/22, 05/18/22, 08:57:19, 1,4-Dioxane, 123-21-1, 0.108, 0.088, 0.988, mg/L, Flat, 84.1, 82, 103

Comments: 20 method blanks (MB) & 20 method blanks (MB) were used. All values were below the detection limit. No values were reported for 1,4-Dioxane. All values were below the reporting limit. All values were below the detection limit.

QA/QC Batch Summary: Internal Standards: Normal standards were used for the acceptance criteria with the following exceptions: None. Laboratory Reagent Blanks: A laboratory reagent blank (LRB) was analyzed with each QA/QC batch. The LRB met the acceptance criteria with the following exceptions: None. Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS): A laboratory fortified blank (LFB) was analyzed with each QA/QC batch. The LFB met the acceptance criteria with the following exceptions: None. Matrix Spikes and Spike Duplicates: A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed with each QA/QC batch. The MSD met the acceptance criteria with the following exceptions: None. Matrix Replicates: A matrix replicate (MR) and matrix replicate duplicate (MRD) was analyzed with each QA/QC batch. The MR met the acceptance criteria with the following exceptions: None.





1,4-Dioxane by GC/MS

Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDOG Number	0314221	Instrument	7100V
Client Sample ID	Out68	Subsample (mL)	5.000
Laboratory Sample ID	0314221-1	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/15/2022 06:00	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/14/2022
QC Batch Number	QC08G0314221	Analysis Date	03/14/2022 11:06:02

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	0.000	0.001		U

COMMENTS
 All methods reference 10 (1) mL methanol unless otherwise noted.
 Calculations performed per 16 CFR 162.10.
 Please specify reporting unit (RPT) based upon basis calibration standard.
 All detection methods require 100 (1) mL based upon sample dilution.
 Sample analyzed at 100 (1) µL.

Office: 734-695-0995
 Fax: 734-695-3731



1,4-Dioxane by GC/MS

Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDOG Number	0314221	Instrument	7100V
Client Sample ID	Ref 1200	Subsample (mL)	5.000
Laboratory Sample ID	0314221-2	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/14/2022 7:45	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/14/2022
QC Batch Number	QC08G0314221	Analysis Date	03/14/2022 11:48:59

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	0.43	0.04		M

COMMENTS
 All methods reference 10 (1) mL methanol unless otherwise noted.
 Calculations performed per 16 CFR 162.10.
 Please specify reporting unit (RPT) based upon basis calibration standard.
 All detection methods require 100 (1) mL based upon sample dilution.
 Sample analyzed at 100 (1) µL.

Office: 734-695-0995
 Fax: 734-695-3731



1,4-Dioxane by GC/MS

Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDOG Number	0314221	Instrument	7100V
Client Sample ID	MM-21	Subsample (mL)	5.000
Laboratory Sample ID	0314221-3	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/15/2022 8:15	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/14/2022
QC Batch Number	QC08G0314221	Analysis Date	03/14/2022 18:24:47

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	ND	0.001		U

COMMENTS
 All methods reference 10 (1) mL methanol unless otherwise noted.
 Calculations performed per 16 CFR 162.10.
 Please specify reporting unit (RPT) based upon basis calibration standard.
 All detection methods require 100 (1) mL based upon sample dilution.
 Sample analyzed at 100 (1) µL.

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1,4-Dioxane by GC/MS

Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDOG Number	0314221	Instrument	7100V
Client Sample ID	MM-1316	Subsample (mL)	5.000
Laboratory Sample ID	0314221-03	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/15/2022 9:36	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/14/2022
QC Batch Number	QC08G0314221	Analysis Date	03/14/2022 18:09:38

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	ND	0.001		U

COMMENTS
 All methods reference 10 (1) mL methanol unless otherwise noted.
 Calculations performed per 16 CFR 162.10.
 Please specify reporting unit (RPT) based upon basis calibration standard.
 All detection methods require 100 (1) mL based upon sample dilution.
 Sample analyzed at 100 (1) µL.

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1,4-Dioxane by GC/MS

Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDOG Number	0314221	Instrument	7100V
Client Sample ID	MM-1316	Subsample (mL)	5.000
Laboratory Sample ID	0314221-1	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/15/2022 11:00	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/14/2022
QC Batch Number	QC08G0314221	Analysis Date	03/14/2022 19:52:30

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	ND	0.001		U

COMMENTS
 All methods reference 10 (1) mL methanol unless otherwise noted.
 Calculations performed per 16 CFR 162.10.
 Please specify reporting unit (RPT) based upon basis calibration standard.
 All detection methods require 100 (1) mL based upon sample dilution.
 Sample analyzed at 100 (1) µL.

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 Fax: 734-695-3731



1,4-Dioxane by GC/MS

Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDOG Number	0314221	Instrument	7100V
Client Sample ID	MM-1300	Subsample (mL)	5.000
Laboratory Sample ID	0314221-12	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/15/2022 12:46	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/14/2022
QC Batch Number	QC08G0314221	Analysis Date	03/14/2022 20:38:17

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	ND	0.001		U

COMMENTS
 All methods reference 10 (1) mL methanol unless otherwise noted.
 Calculations performed per 16 CFR 162.10.
 Please specify reporting unit (RPT) based upon basis calibration standard.
 All detection methods require 100 (1) mL based upon sample dilution.
 Sample analyzed at 100 (1) µL.

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 Fax: 734-695-3731



1,4-Dioxane by GC/MS

Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDOG Number	0314221	Instrument	7100V
Client Sample ID	MM-1205	Subsample (mL)	5.000
Laboratory Sample ID	0314221-13	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/15/2022 14:00	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/14/2022
QC Batch Number	QC08G0314221	Analysis Date	03/14/2022 21:19:57

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	0.002	0.001		U

COMMENTS
 All methods reference 10 (1) mL methanol unless otherwise noted.
 Calculations performed per 16 CFR 162.10.
 Please specify reporting unit (RPT) based upon basis calibration standard.
 All detection methods require 100 (1) mL based upon sample dilution.
 Sample analyzed at 100 (1) µL.

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1,4-Dioxane by GC/MS

Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDOG Number	0315221	Instrument	7100V
Client Sample ID	Out68	Subsample (mL)	5.000
Laboratory Sample ID	0315221-1	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/14/2022 04:00	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/15/2022
QC Batch Number	QC08G0314221	Analysis Date	03/15/2022 12:37:54

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	0.006	0.001		U

COMMENTS
 All methods reference 10 (1) mL methanol unless otherwise noted.
 Calculations performed per 16 CFR 162.10.
 Please specify reporting unit (RPT) based upon basis calibration standard.
 All detection methods require 100 (1) mL based upon sample dilution.
 Sample analyzed at 100 (1) µL.

Office: 734-695-0995
 Fax: 734-695-3731



1,4-Dioxane by GC/MS
Data Summary Sheet

ATSI Project Number	0201-002-22	Percent Moisture	100.0
ATSI SDO Number	031021	Instrument	7100V
Client Sample ID	MW-112	Subsample (mL)	0.500
Laboratory Sample ID	031021-10	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/15/2022 12:02	Batch	YH1
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/16/2022 19:36:45
QC Batch Number	QCGH0316021	Analysis Date	03/16/2022 19:36:45

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.002	0.01		

Comments:
All methods reference 1631 for methods unless otherwise noted.
Concentration reported as mg/L unless otherwise noted.
Final volume reported as mL. Dilution factor based on final volume reported.
If no detection reported, reporting limit (MDL) based upon lowest calibration standard.
If no detection reported, reporting limit (PQL) based upon sample dilution.



1,4-Dioxane by GC/MS
Data Summary Sheet

ATSI Project Number	0201-002-22	Percent Moisture	100.0
ATSI SDO Number	031021	Instrument	7100V
Client Sample ID	MW-112	Subsample (mL)	0.500
Laboratory Sample ID	031021-11	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/15/2022 13:15	Batch	YH1
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/16/2022 19:20:23
QC Batch Number	QCGH0316021	Analysis Date	03/16/2022 19:20:23

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.010	0.01		

Comments:
All methods reference 1631 for methods unless otherwise noted.
Concentration reported as mg/L unless otherwise noted.
Final volume reported as mL. Dilution factor based on final volume reported.
If no detection reported, reporting limit (MDL) based upon lowest calibration standard.
If no detection reported, reporting limit (PQL) based upon sample dilution.



1,4-Dioxane by GC/MS
Data Summary Sheet

ATSI Project Number	0201-002-22	Percent Moisture	100.0
ATSI SDO Number	031021	Instrument	7100V
Client Sample ID	MW-1024	Subsample (mL)	0.500
Laboratory Sample ID	031021-12	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/16/2022 14:25	Batch	YH1
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/16/2022 21:48:00
QC Batch Number	QCGH0316021	Analysis Date	03/16/2022 21:48:00

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.009	0.01		

Comments:
All methods reference 1631 for methods unless otherwise noted.
Concentration reported as mg/L unless otherwise noted.
Final volume reported as mL. Dilution factor based on final volume reported.
If no detection reported, reporting limit (MDL) based upon lowest calibration standard.
If no detection reported, reporting limit (PQL) based upon sample dilution.



1,4-Dioxane by GC/MS
Data Summary Sheet

ATSI Project Number	0201-002-22	Percent Moisture	100.0
ATSI SDO Number	031721a	Instrument	7100V
Client Sample ID	Outfall	Subsample (mL)	0.500
Laboratory Sample ID	031721-11	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/16/2022 14:00	Batch	YH1
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022 11:06:16
QC Batch Number	QCGH0317221	Analysis Date	03/17/2022 11:06:16

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.006	0.01		

Comments:
All methods reference 1631 for methods unless otherwise noted.
Concentration reported as mg/L unless otherwise noted.
Final volume reported as mL. Dilution factor based on final volume reported.
If no detection reported, reporting limit (MDL) based upon lowest calibration standard.
If no detection reported, reporting limit (PQL) based upon sample dilution.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATSI Project Number	0201-002-22	Percent Moisture	100.0
ATSI SDO Number	031721a	Instrument	7100V
Client Sample ID	Red Pond	Subsample (mL)	0.500
Laboratory Sample ID	031721-2	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	40
Sample Date	03/17/2022 7:35	Batch	YH1
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022 12:55:52
QC Batch Number	QCGH0317221	Analysis Date	03/17/2022 12:55:52

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.47	0.04		M

Comments:
All methods reference 1631 for methods unless otherwise noted.
Concentration reported as mg/L unless otherwise noted.
Final volume reported as mL. Dilution factor based on final volume reported.
If no detection reported, reporting limit (MDL) based upon lowest calibration standard.
If no detection reported, reporting limit (PQL) based upon sample dilution.



1,4-Dioxane by GC/MS
Data Summary Sheet

ATSI Project Number	0201-002-22	Percent Moisture	100.0
ATSI SDO Number	031721a	Instrument	7100V
Client Sample ID	LB-4	Subsample (mL)	0.500
Laboratory Sample ID	031721-10	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	10
Sample Date	03/16/2022 9:58	Batch	YH1
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022 17:36:41
QC Batch Number	QCGH0317221	Analysis Date	03/17/2022 17:36:41

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.49	0.01		M

Comments:
All methods reference 1631 for methods unless otherwise noted.
Concentration reported as mg/L unless otherwise noted.
Final volume reported as mL. Dilution factor based on final volume reported.
If no detection reported, reporting limit (MDL) based upon lowest calibration standard.
If no detection reported, reporting limit (PQL) based upon sample dilution.



1,4-Dioxane by GC/MS
Data Summary Sheet

ATSI Project Number	0201-002-22	Percent Moisture	100.0
ATSI SDO Number	031721a	Instrument	7100V
Client Sample ID	TW-29	Subsample (mL)	0.500
Laboratory Sample ID	031721-10	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	10
Sample Date	03/16/2022 9:55	Batch	YH1
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022 18:20:41
QC Batch Number	QCGH0317221	Analysis Date	03/17/2022 18:20:41

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.41	0.01		M

Comments:
All methods reference 1631 for methods unless otherwise noted.
Concentration reported as mg/L unless otherwise noted.
Final volume reported as mL. Dilution factor based on final volume reported.
If no detection reported, reporting limit (MDL) based upon lowest calibration standard.
If no detection reported, reporting limit (PQL) based upon sample dilution.



1,4-Dioxane by GC/MS
Data Summary Sheet

ATSI Project Number	0201-002-22	Percent Moisture	100.0
ATSI SDO Number	031721a	Instrument	7100V
Client Sample ID	TW-29	Subsample (mL)	0.500
Laboratory Sample ID	031721-11	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	10
Sample Date	03/16/2022 10:10	Batch	YH1
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022 18:04:37
QC Batch Number	QCGH0317221	Analysis Date	03/17/2022 18:04:37

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.44	0.01		M

Comments:
All methods reference 1631 for methods unless otherwise noted.
Concentration reported as mg/L unless otherwise noted.
Final volume reported as mL. Dilution factor based on final volume reported.
If no detection reported, reporting limit (MDL) based upon lowest calibration standard.
If no detection reported, reporting limit (PQL) based upon sample dilution.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	031721a	Instrument	2100V
Client Sample ID	TW-14	Subsample (mL)	5.000
Laboratory Sample ID	031721-12	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	5
Sample Date	03/16/2022 10:36	Batch	W01
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022
QC Batch Number	02080317221	Analysis Date	03/17/2022 10:48:23

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.13	0.005		M

Comments:
All methods reference 10 (1) to maintain uniformity across methods.
Concentration performance per 16 CFR 161.10.
Final volume reported per 16 CFR 161.10.
Preparation method reported per 16 CFR 161.10.
Matrix reported per 16 CFR 161.10.
QC batch number reported per 16 CFR 161.10.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	031721a	Instrument	2100V
Client Sample ID	TW-15	Subsample (mL)	5.000
Laboratory Sample ID	031721-13	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	5
Sample Date	03/16/2022 10:40	Batch	W01
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022
QC Batch Number	02080317221	Analysis Date	03/17/2022 10:33:24

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.054	0.005		M

Comments:
All methods reference 10 (1) to maintain uniformity across methods.
Concentration performance per 16 CFR 161.10.
Final volume reported per 16 CFR 161.10.
Preparation method reported per 16 CFR 161.10.
Matrix reported per 16 CFR 161.10.
QC batch number reported per 16 CFR 161.10.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	031721a	Instrument	2100V
Client Sample ID	TW-16	Subsample (mL)	5.000
Laboratory Sample ID	031721-14	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	5
Sample Date	03/16/2022 11:09	Batch	W01
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022
QC Batch Number	02080317221	Analysis Date	03/17/2022 11:16:23

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.01	0.01		M

Comments:
All methods reference 10 (1) to maintain uniformity across methods.
Concentration performance per 16 CFR 161.10.
Final volume reported per 16 CFR 161.10.
Preparation method reported per 16 CFR 161.10.
Matrix reported per 16 CFR 161.10.
QC batch number reported per 16 CFR 161.10.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	031721a	Instrument	2100V
Client Sample ID	TW-22	Subsample (mL)	5.000
Laboratory Sample ID	031721-15	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	5
Sample Date	03/16/2022 11:05	Batch	W01
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022
QC Batch Number	02080317221	Analysis Date	03/17/2022 10:50:14

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.50	0.01		M

Comments:
All methods reference 10 (1) to maintain uniformity across methods.
Concentration performance per 16 CFR 161.10.
Final volume reported per 16 CFR 161.10.
Preparation method reported per 16 CFR 161.10.
Matrix reported per 16 CFR 161.10.
QC batch number reported per 16 CFR 161.10.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	031721a	Instrument	2100V
Client Sample ID	TW-28	Subsample (mL)	5.000
Laboratory Sample ID	031721-16	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	10
Sample Date	03/16/2022 11:10	Batch	W01
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022
QC Batch Number	02080317221	Analysis Date	03/17/2022 22:44:03

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.86	0.01		M

Comments:
All methods reference 10 (1) to maintain uniformity across methods.
Concentration performance per 16 CFR 161.10.
Final volume reported per 16 CFR 161.10.
Preparation method reported per 16 CFR 161.10.
Matrix reported per 16 CFR 161.10.
QC batch number reported per 16 CFR 161.10.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	031721a	Instrument	2100V
Client Sample ID	TW-29	Subsample (mL)	5.000
Laboratory Sample ID	031721-17	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	10
Sample Date	03/16/2022 11:15	Batch	W01
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022
QC Batch Number	02080317221	Analysis Date	03/16/2022 08:58:44

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.75	0.01		M

Comments:
All methods reference 10 (1) to maintain uniformity across methods.
Concentration performance per 16 CFR 161.10.
Final volume reported per 16 CFR 161.10.
Preparation method reported per 16 CFR 161.10.
Matrix reported per 16 CFR 161.10.
QC batch number reported per 16 CFR 161.10.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	031721a	Instrument	2100V
Client Sample ID	TW-31	Subsample (mL)	5.000
Laboratory Sample ID	031721-18	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	20
Sample Date	03/16/2022 11:20	Batch	W01
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022
QC Batch Number	02080317222	Analysis Date	03/20/2022 10:50:05

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	1.0	0.02		M

Comments:
All methods reference 10 (1) to maintain uniformity across methods.
Concentration performance per 16 CFR 161.10.
Final volume reported per 16 CFR 161.10.
Preparation method reported per 16 CFR 161.10.
Matrix reported per 16 CFR 161.10.
QC batch number reported per 16 CFR 161.10.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	031721a	Instrument	2100V
Client Sample ID	02LPH	Subsample (mL)	5.000
Laboratory Sample ID	031721-19	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	3
Sample Date	03/16/2022 11:25	Batch	W01
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022
QC Batch Number	02080317222	Analysis Date	03/20/2022 20:59:38

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.15	0.005		M

Comments:
All methods reference 10 (1) to maintain uniformity across methods.
Concentration performance per 16 CFR 161.10.
Final volume reported per 16 CFR 161.10.
Preparation method reported per 16 CFR 161.10.
Matrix reported per 16 CFR 161.10.
QC batch number reported per 16 CFR 161.10.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	0317216	Instrument	2100V
Client Sample ID	TW-24	Subsample (mL)	5.000
Laboratory Sample ID	031721-20	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/16/2022 11:39	Units	mg/L
Analytical Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022
Preparation Method (USEPA)	USEPA 1624	Analyzsis Date	03/23/2022 09:20:48
QC Batch Number	QCCOR0317222		

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	2.5	0.04		M

Comments:
All methods reference US EPA methods unless otherwise noted.
Concentrations are reported as found.
Peak names are reported as found. If a peak is not identified, it is not reported.
M: Method detection limit by GC/MS based upon sample dilution.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	0317216	Instrument	2100V
Client Sample ID	TW-18	Subsample (mL)	5.000
Laboratory Sample ID	031721-21	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	10
Sample Date	03/16/2022 12:18	Units	mg/L
Analytical Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022
Preparation Method (USEPA)	USEPA 1624	Analyzsis Date	03/23/2022 09:20:48
QC Batch Number	QCCOR0317222		

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	0.26	0.01		M

Comments:
All methods reference US EPA methods unless otherwise noted.
Concentrations are reported as found.
Peak names are reported as found. If a peak is not identified, it is not reported.
M: Method detection limit by GC/MS based upon sample dilution.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	0317216	Instrument	2100V
Client Sample ID	TW-21	Subsample (mL)	5.000
Laboratory Sample ID	031721-22	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	10
Sample Date	03/16/2022 12:18	Units	mg/L
Analytical Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022
Preparation Method (USEPA)	USEPA 1624	Analyzsis Date	03/23/2022 09:18:00
QC Batch Number	QCCOR0317222		

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	0.26	0.01		M

Comments:
All methods reference US EPA methods unless otherwise noted.
Concentrations are reported as found.
Peak names are reported as found. If a peak is not identified, it is not reported.
M: Method detection limit by GC/MS based upon sample dilution.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	0317216	Instrument	2100V
Client Sample ID	MM-1201	Subsample (mL)	5.000
Laboratory Sample ID	031721-23	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/16/2022 9:37	Units	mg/L
Analytical Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022
Preparation Method (USEPA)	USEPA 1624	Analyzsis Date	03/23/2022 09:53:51
QC Batch Number	QCCOR0317222		

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	ND	0.001		U

Comments:
All methods reference US EPA methods unless otherwise noted.
Concentrations are reported as found.
Peak names are reported as found. If a peak is not identified, it is not reported.
M: Method detection limit by GC/MS based upon sample dilution.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	0317216	Instrument	2100V
Client Sample ID	MM-1201	Subsample (mL)	5.000
Laboratory Sample ID	031721-24	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/16/2022 10:48	Units	mg/L
Analytical Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022
Preparation Method (USEPA)	USEPA 1624	Analyzsis Date	03/23/2022 10:31:10
QC Batch Number	QCCOR0317222		

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	ND	0.001		U

Comments:
All methods reference US EPA methods unless otherwise noted.
Concentrations are reported as found.
Peak names are reported as found. If a peak is not identified, it is not reported.
M: Method detection limit by GC/MS based upon sample dilution.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	0317216	Instrument	2100V
Client Sample ID	MM-76	Subsample (mL)	5.000
Laboratory Sample ID	031721-25	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	3
Sample Date	03/16/2022 12:12	Units	mg/L
Analytical Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022
Preparation Method (USEPA)	USEPA 1624	Analyzsis Date	03/23/2022 09:20:48
QC Batch Number	QCCOR0317222		

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	0.13	0.005		M

Comments:
All methods reference US EPA methods unless otherwise noted.
Concentrations are reported as found.
Peak names are reported as found. If a peak is not identified, it is not reported.
M: Method detection limit by GC/MS based upon sample dilution.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	0317216	Instrument	2100V
Client Sample ID	MM-76	Subsample (mL)	5.000
Laboratory Sample ID	031721-26	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	10
Sample Date	03/16/2022 14:58	Units	mg/L
Analytical Method (USEPA)	USEPA 1624	Preparation Date	03/17/2022
Preparation Method (USEPA)	USEPA 1624	Analyzsis Date	03/23/2022 09:18:00
QC Batch Number	QCCOR0317222		

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	0.29	0.01		M

Comments:
All methods reference US EPA methods unless otherwise noted.
Concentrations are reported as found.
Peak names are reported as found. If a peak is not identified, it is not reported.
M: Method detection limit by GC/MS based upon sample dilution.

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1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SDO Number	0318221	Instrument	2100V
Client Sample ID	QCCOR	Subsample (mL)	5.000
Laboratory Sample ID	031822-1-4	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/17/2022 4:02	Units	mg/L
Analytical Method (USEPA)	USEPA 1624	Preparation Date	03/18/2022
Preparation Method (USEPA)	USEPA 1624	Analyzsis Date	03/18/2022 10:16:28
QC Batch Number	QCCOR0318221		

Parameter	CAS#	Result	MDL	PDL	Qual
1,4-Dioxane	123-91-1	0.006	0.001		

Comments:
All methods reference US EPA methods unless otherwise noted.
Concentrations are reported as found.
Peak names are reported as found. If a peak is not identified, it is not reported.
M: Method detection limit by GC/MS based upon sample dilution.

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1,4-Dioxane by GC/MS

Data Summary Sheet

ATF Project Number: 0511-0522
ATF EDO Number: 010221
Client Sample ID: M1701

Instrument: 7100
Substrate (s): 1
Sample Size: 1
Analysis Date: 03/10/2012 13:02:28

Parameter: 1,4-Dioxane
Result: 9.47
MQL: 0.04
Unit: M

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1,4-Dioxane by GC/MS

Data Summary Sheet

ATF Project Number: 0511-0522
ATF EDO Number: 010221
Client Sample ID: M1701

Instrument: 7100
Substrate (s): 1
Sample Size: 1
Analysis Date: 03/10/2012 11:02

Parameter: 1,4-Dioxane
Result: 0.003
MQL: 0.001
Unit: M

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1,4-Dioxane by GC/MS

Data Summary Sheet

ATF Project Number: 0511-0522
ATF EDO Number: 010221
Client Sample ID: M1701

Instrument: 7100
Substrate (s): 1
Sample Size: 1
Analysis Date: 03/10/2012 12:22

Parameter: 1,4-Dioxane
Result: 0.001
MQL: 0.001
Unit: M

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1,4-Dioxane by GC/MS

Data Summary Sheet

ATF Project Number: 0511-0522
ATF EDO Number: 010221
Client Sample ID: M1701

Instrument: 7100
Substrate (s): 1
Sample Size: 1
Analysis Date: 03/10/2012 14:11

Parameter: 1,4-Dioxane
Result: 0.08
MQL: 0.02
Unit: M

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Data Transmittal Cover Page

Project Name: Pall Corporation
ATS Project Number: G001-002
ATS Report Number(s): Inorg_SRF_0321221
Client PO Number: 4505179640
Project Description: This data report contains the results of 10 water samples, received by ATS on March 21, 2002 to be analyzed for 1,4-Dioxane.

ORGANIC ANALYSIS
1,4-Dioxane by GC/MS
USEPA 1624

LABORATORY OPERATIONS
CASE NARRATIVE

ATS Project Number: G001-002
Report Date: 3/28/02
SRF / SDG Number(s): 0321221
Client PO Number: 4505179649

Case Narrative Summary

This case narrative applies to the following 10 samples that were received at Ann Arbor Technical Services, Inc. (ATS) on 3/21/02, and associated matrix-specific QA/QC:

Client Sample Identification	Sample Date	Requested Turn Around Time	Analysis	Matrix
Recovery 3/21/02	3/21/02			
Red Pond	3/21/02	Urgent	1,4-Dioxane	Water
Combination Effluent	3/21/02	Urgent	1,4-Dioxane	Water
FFOC-1a	3/21/02	Urgent	1,4-Dioxane	Water
FFOC-2a	3/21/02	Urgent	1,4-Dioxane	Water
MW-1	3/21/02	Urgent	1,4-Dioxane	Water
Chetfield Creek	3/21/02	Urgent	1,4-Dioxane	Water
MW-100	3/21/02	Standard	1,4-Dioxane	Water
MSD-DP	3/18/02	Standard	1,4-Dioxane	Water

We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratories, as required by USEPA. Laboratory data sheets, SOPs, and QA/QC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

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Amanda Isabella (amanda.isabella@pall.com)

ATS Project Number: G001-002.23
ATS SDG: 0321221

Upon receipt samples were scheduled for the following analyses:

- Analysis
 - 1,4-Dioxane (USEPA 1624) - Urgent TAT
 - 1,4-Dioxane (USEPA 1624) - Standard TAT
- Number of Samples
 - 8 Samples + 1 Matrix Spike + 1 Matrix Spike Duplicate
 - 2 Samples

Date: 3/28/02 Signed: [Signature]

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Prepared By:
Ann Arbor Technical Services, Inc.
290 South Wagner Road
Ann Arbor, MI 48103

0801-002.23-CN_0321221.doc
Consultants in Chemistry & Environmental Science
290 South Wagner Road, Ann Arbor, Michigan 48106 Tel: 734-995-0000 Fax: 734-995-3731

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pall Corporation state. Samples were received with proper chain of custody records included. Sample conditions and anomalies, if any, are either presented in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exceptions:

- None

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written standard operating procedure (SOP) specific to the ATS Laboratory, as required by USEPA. All data are peer and management reviewed to ensure compliance with the above referenced SOP's and project specifications. In addition, all data conform to the laboratory's Quality Assurance / Quality Control Manuals.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LRB), fortified blanks (BS, LFB, LCS), matrix spikes (MS, SPC), and duplicates whether spiked or native (LMD, MSD, SPC, DUP, LDX, LRS).

Data Qualifications, Specifications, and Technical Narration

The following are qualifier descriptions that may be used throughout this SDG and are presented with their associated samples in each SDG section as appropriate.

- "M" - exceeds the calibration range of the method
- "D" - result taken from sample dilution
- "P" - concentration reported between the Laboratory Instrument determined Method Detection Limit (MDL), Limit of Detection (LOD), and the Practical Quantitation Limit (PQL)/Limit of Quantitation (LOQ)
- "CML" - concentration reported below the Laboratory Instrument Method Detection Limit (MDL)/Limit of Quantitation (LOQ) and the instrument Signal to Noise Ratio (SNR) of approximately 10:1
- "N" - analyze concentration in method blank exceeds reporting limit
- "N+" - analyze net detected above MDL / LOD
- "M+" - indicates matrix interference
- "T" - indicates ion ratio between 15 and 30 % acceptance window
- "N(-)" - indicates ion ratio outside 30% acceptance window and result is Not Reported

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LRB), fortified blanks (BS, LFB, LCS), matrix spikes (LPM, MS, SPC), and duplicates whether spiked or native (LMD, MSD, SPC, DUP, LDX, LRS).

Data Deliverables

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, CFA, R5 EDD) are available upon request. There were no hardcopy data summary sheets generated for this project.

K:\G001-002.23\Data_Transmittal_Cover_Page_SLS.doc

Sample Analysis

1,4-Dioxane Analysis (GC/MS): Samples were analyzed by purge and trap GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Integrate Dilution Gas Chromatography - Mass Spectrometry). An initial calibration with at least five levels was used to quantify 1,4-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Anomalies Note:

Sample Dilutions

Samples containing compounds at concentrations above the initial calibration curve were diluted and reanalyzed for those compounds. The following samples were diluted for 1,4-Dioxane:

- Red Pond 3/21/02
- MW-100 3/18/02
- MW-22 3/18/02

Laboratory Reagent Blanks

A laboratory reagent blank (LRB) was analyzed as part of the QA/QC batch. The LRB met the acceptance criteria with the following exceptions:

- None

Internal Standards and Surrogates - Quantitation

This method utilizes Internal Standards only, not Surrogates. Internal standards areas and retention times met the acceptance criteria with the following exceptions:

- None

ACCURACY

Laboratory Fortified Blanks (LFB/OFR) Laboratory Control Samples - Accuracy

A laboratory fortified blank (LFB/OFR) was analyzed as part of the QA/QC batch. The LFB/OFR met the acceptance criteria with the following exceptions:

- None

Matrix Spikes and Matrix Spike Duplicates - Accuracy

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD's met the accuracy acceptance criteria with the following exceptions:

Lab Sample ID	Constituent	Percent Recovery	Acceptance Limits
0321221-2 MS	1,4-Dioxane	135	80-120%
0321221-2 MSD	1,4-Dioxane	131	80-120%

0801-002.23-CN_0321221.doc

PRECISION

Matrix Spike and Matrix Spike Duplicates - Precision

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD's met the precision acceptance criteria with the following exceptions:

- None

[Signature] / March 28, 2002
Mark T. DeLong (Quality Assurance Coordinator)

[Signature] / March 28, 2002
Philip B. Simon (Laboratory Director)

0801-002.23-CN_0321221.doc

Requested Turnaround Time Priority Number: 1 - Urgent, 2 - Non, 3 - Standard

Lab Sample ID	Constituent	Priority	Analysis	Matrix	Result	Units	Reporting Limit	Acceptance Criteria	Notes
0321221-2 MS	1,4-Dioxane	1	GC/MS	Water	1.35	mg/L	0.1	80-120%	
0321221-2 MSD	1,4-Dioxane	1	GC/MS	Water	1.31	mg/L	0.1	80-120%	



CHAIN OF CUSTODY RECORD

Page 1

0801-002.23-CN_0321221.doc



ANN ARBOR TECHNICAL SERVICES, INC.
QUALITY ASSURANCE/QUALITY CONTROL SUMMARY
LABORATORY FILE# SUMMARY



ANN ARBOR TECHNICAL SERVICES, INC.
QUALITY ASSURANCE/QUALITY CONTROL SUMMARY
LABORATORY RECEIPT SUMMARY

Client Name	Client Address	Client City	Client State	Client Zip	Client Phone	Client Fax	Client Email	Client Website	Client Logo	Client Other
Client Name	Client Address	Client City	Client State	Client Zip	Client Phone	Client Fax	Client Email	Client Website	Client Logo	Client Other



ANN ARBOR TECHNICAL SERVICES, INC.
QUALITY ASSURANCE/QUALITY CONTROL SUMMARY
LABORATORY RECEIPT SUMMARY

Client Name	Client Address	Client City	Client State	Client Zip	Client Phone	Client Fax	Client Email	Client Website	Client Logo	Client Other
Client Name	Client Address	Client City	Client State	Client Zip	Client Phone	Client Fax	Client Email	Client Website	Client Logo	Client Other



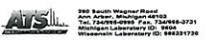
ANN ARBOR TECHNICAL SERVICES, INC.
QUALITY ASSURANCE/QUALITY CONTROL SUMMARY
LABORATORY RECEIPT SUMMARY

Client Name	Client Address	Client City	Client State	Client Zip	Client Phone	Client Fax	Client Email	Client Website	Client Logo	Client Other
Client Name	Client Address	Client City	Client State	Client Zip	Client Phone	Client Fax	Client Email	Client Website	Client Logo	Client Other



ANN ARBOR TECHNICAL SERVICES, INC.
QUALITY ASSURANCE/QUALITY CONTROL SUMMARY
LABORATORY RECEIPT SUMMARY

Client Name	Client Address	Client City	Client State	Client Zip	Client Phone	Client Fax	Client Email	Client Website	Client Logo	Client Other
Client Name	Client Address	Client City	Client State	Client Zip	Client Phone	Client Fax	Client Email	Client Website	Client Logo	Client Other



Data Transmittal Cover Page

Project Name: Pail Corporation
 ATS Project Number: G001-002
 ATS Report Number(s): Inorg_SRF_0322221
 Client PO Number: 4505179640
 Project Description: This data report contains the results of 10 water samples, received by ATS on March 22, 2022 to be analyzed for 1,4 Dioxane.

We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratories, as required by USEPA. Laboratory data sheets, SOPs, and QA/QC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Gage Trendel
 Email: gage_trendel@pail.com
 FAX Number:

No. of Pages (including cover pg.): 22

From: Sarah Shubertfeld
 Email: Sarah.Shubertfeld@AnnArborTechnicalServices.com
 FAX Number: 734-995-3731

Additional Message: Copy report to: Patterson, Keith (keith.patterson@pail.com), Brode, Jim (jim.brode@pail.com), Katic, Stephanie (skatic@annarborats.com), Woodard@annarborats.com, Palara, Susi Palara (susi.palara@pail.com), Amanda Isabella (amanda.isabella@pail.com)

Date: 3/28/22
 Signed:

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ORGANIC ANALYSIS
1,4-Dioxane by GC/MS
USEPA 1624

ATS Project Number: G001-002.22
 ATS SDG: 0322221

Prepared By:
 Ann Arbor Technical Services, Inc.
 290 South Wagner Road
 Ann Arbor, MI 48113



LABORATORY OPERATIONS
CASE NARRATIVE

ATS Project Number: G001-002
 Report Date: 3/28/22
 SRF / SDG Number(s): 0322221
 Client PO Number: 4505179649

Case Narrative Summary
 This case narrative applies to the following 10 samples that were received at Ann Arbor Technical Services, Inc. (ATS) on 3/22/22, and associated matrix-specific QA/QC:

Client Sample Identification	Sample Date	Requested Turn Around Time	Analysis	Matrix
Received: 3/22/22				
Outlet SW	3/22/22	Urgent	1,4-Dioxane	Water
Red Pond	3/22/22	Urgent	1,4-Dioxane	Water
Combustion Effluent	3/22/22	Urgent	1,4-Dioxane	Water
PPF-QC-1a	3/22/22	Urgent	1,4-Dioxane	Water
PPF-QC-2a	3/22/22	Urgent	1,4-Dioxane	Water
SP-1	3/22/22	Urgent	1,4-Dioxane	Water
Outlet Gwh	3/22/22	Urgent	1,4-Dioxane	Water
Outlet Tm	3/22/22	Urgent	1,4-Dioxane	Water
4461-131	3/21/22	Standard	1,4-Dioxane	Water
173 Pumphouse Deep	3/21/22	Standard	1,4-Dioxane	Water

Upon receipt samples were scheduled for the following analysis:
 Analysis:
 • 1,4-Dioxane (USEPA 1624) - Urgent TAT
 • 1,4-Dioxane (USEPA 1624) - Standard TAT
 Number of Samples:
 • 8 Samples + 1 Matrix Spike + 1 Matrix Spike Duplicate
 • 2 Samples

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pail Corporation staff. Samples were received with proper chain of custody records included. Sample condition and anomalies, if any, are either presented in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exceptions:
 • None

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written standard operating procedure (SOP) specific to the ATS Laboratory, as required by USEPA. All data are peer and management reviewed to ensure compliance with the above referenced SOP's and project specifications. In addition, all data conform to the laboratory's Quality Assurance / Quality Control Manuals.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LMB), fortified blanks (FB, LFB, LCS), matrix spikes (MS, SPK), and duplicates whether spiked or native (MSD, SPK DUP, DUP, LFB).

Data Qualifications, Specifications, and Technical Narration

The following are qualifier descriptions that may be used throughout this SDG and are presented with their associated samples in each SDG section as appropriate.

- "E" - exceeds the calibration range of the method
- "DP" - result taken from sample dilution
- "C" - concentrations reported between the laboratory/instrument determined Method Detection Limit (MDL)/Limit of Detection (LOD), and the Practical Quantitation Limit (PQL)/Limit of Quantitation (LOQ)
- "MDC" - concentration reported below the laboratory/instrument Method Detection Limit (MDL)/Limit of Quantitation (LOQ) and the instrument Signal To Noise Ratio (SNR) of approximately 10:1
- "N" - analyte concentration in method blank exceeds reporting limit
- "L" - analyte not detected above MDL / LOD
- "I" - indicates analyte has exceeded batch or sample specific QA/QC control limits
- "M" - indicates matrix interference
- "T" - indicates ion ratio between 15 and 30% acceptance window
- "NE" - indicates ion ratio outside 30% acceptance window and result is Not Reported

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LMB), fortified blanks (FB, LFB, LCS), matrix spikes (LFB, MS, SPK), and duplicates whether spiked or native (LFB, MSD, SPK, DUP, LFB, LFB).

Data Deliverables

This data package includes a Level II package; other data report packages (Level I, Level IV DVP, EPA ITS EDD) are available upon request. There were no hardcopy data summary sheets generated for this project.





ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY BLANK SUMMARY

Table with 4 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name. Row 1: LFA-1 9/22/12, 03:22:02, 03:22:42, 1.4 Chlorine.

Table with 12 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Field, Unit, Base, Method Detection Limit, Reporting Detection Limit, Qualifier. Row 1: LFA-1 9/22/12, 03:22:02, 03:22:42, 1.4 Chlorine, 12391-1, mg/L, mg/L, 0.01.

Comments: All matrix spikes (MS) and matrix spike duplicates (MSD) were analyzed as part of the QAC/OC batch. The MS/MSD met the precision acceptance criteria with the following exceptions:



CHAIN OF CUSTODY RECORD

Large table for Chain of Custody Record with columns for Date, Time, Location, and various fields for sample tracking.

* - Requested Turn-Around Time Priority Number Key: 1 = Urgent 2 = Rush 3 = Standard

PRECISION
Matrix Spike and Matrix Spike Duplicate - Precision
A matrix spike (MS) and matrix spike duplicate (MSD) were analyzed as part of the QAC/OC batch. The MS/MSD met the precision acceptance criteria with the following exceptions:

Signature: Mark T. DeLong (Quality Assurance Coordinator)
Signature: Philip H. Simon (Laboratory Director)



0801-002-242C, 03/22/12, 04

Sample Analysis
LEAD (Pb) Analysis (LOMS) - Samples were analyzed by purge and trap (PT) in accordance with USEPA Method 1631. All samples were analyzed in duplicate. The mean of the two replicate analyses was used as the final result. The standard deviation (SD) of the two replicate analyses was reported as a measure of precision. Samples were reported as mg/L.

Laboratory Reagent Blanks
A laboratory reagent blank (LRB) was analyzed as part of the QAC/OC batch. The LRB met the acceptance criteria with the following exceptions:

Internal Standards and Surrogate Standards - Accuracy
This method utilizes Internal Standards (IS) and Surrogate Standards (SS) to monitor for matrix effects and to ensure accurate quantification. Internal standards and surrogate standards are added to the sample before extraction. The recovery of the internal standards and surrogate standards was reported as a measure of accuracy. Samples were reported as mg/L.



0801-002-242C, 03/22/12, 04



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY PRECISION SUMMARY

Table with 4 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name. Row 1: LFA-1 9/22/12, 03:22:02, 03:22:42, 1.4 Chlorine.

Table with 12 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Field, Unit, Base, Method Detection Limit, Reporting Detection Limit, Qualifier. Row 1: LFA-1 9/22/12, 03:22:02, 03:22:42, 1.4 Chlorine, 12391-1, mg/L, mg/L, 0.01.

Comments: All matrix spikes (MS) and matrix spike duplicates (MSD) were analyzed as part of the QAC/OC batch. The MS/MSD met the precision acceptance criteria with the following exceptions:



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Table with 4 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name. Row 1: LFA-1 9/22/12, 03:22:02, 03:22:42, 1.4 Chlorine.

Table with 12 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Base, Percent Recovery, LCL, UCL, Qualifier. Row 1: LFA-1 9/22/12, 03:22:02, 03:22:42, 1.4 Chlorine, 12391-1, 0.0043, 0.00, 0.077, mg/L, mg/L, 100, 89, 100.

Comments: All matrix spikes (MS) and matrix spike duplicates (MSD) were analyzed as part of the QAC/OC batch. The MS/MSD met the precision acceptance criteria with the following exceptions:



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Table with 4 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name. Row 1: LFA-1 9/22/12, 03:22:02, 03:22:42, 1.4 Chlorine.

Table with 12 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Base, Percent Recovery, LCL, UCL, Qualifier. Row 1: LFA-1 9/22/12, 03:22:02, 03:22:42, 1.4 Chlorine, 12391-1, 0.0043, 0.00, 0.077, mg/L, mg/L, 100, 89, 100.

Comments: All matrix spikes (MS) and matrix spike duplicates (MSD) were analyzed as part of the QAC/OC batch. The MS/MSD met the precision acceptance criteria with the following exceptions:



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Table with 4 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name. Row 1: LFA-1 9/22/12, 03:22:02, 03:22:42, 1.4 Chlorine.

Table with 12 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Base, Percent Recovery, LCL, UCL, Qualifier. Row 1: LFA-1 9/22/12, 03:22:02, 03:22:42, 1.4 Chlorine, 12391-1, 0.0043, 0.00, 0.077, mg/L, mg/L, 100, 89, 100.

Comments: All matrix spikes (MS) and matrix spike duplicates (MSD) were analyzed as part of the QAC/OC batch. The MS/MSD met the precision acceptance criteria with the following exceptions:

Data Transmittal Cover Page

Project Name: **Pall Corporation**
ATS Project Number: **G001-002**
ATS Report Number(s): **Inorg_SRF_0323221**
Client PO Number: **4505179649**
Project Description: This data report contains the results of 12 water samples, received by ATS on March 23, 2022 to be analyzed for 1,4-Dioxane.

We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratory, as required by USEPA. Laboratory data sheets, SOPs, and QA/QC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Gage Troad Email: gage.troad@pall.com
FAX Number:

No. of Pages (including cover pg.): **25**
From: Sarah Shabfield Email: Sarah.Shabfield@AnnArborTechnicalServices.com
Senior Chemist / Lab Manager FAX Number: 734-995-3731

Additional Message: Copy report to: Patterson, Keith Keith.Patterson@pall.com, Brode Jim Jim.Brode@pall.com
Katie Strohauer kastrohauer@tveeng.com, woods@tve-engineers.com, Paters, Sue Sue.Paters@pall.com
Amanda Isabella amanda_isabella@pall.com

Date: 3/28/22 Signed: 

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ORGANIC ANALYSIS
1,4-Dioxane by GC/MS
USEPA 1624

ATS Project Number: **G001-002.22**

ATS SDG: **0323221**

Prepared By:
Ann Arbor Technical Services, Inc.
290 South Wagner Road
Ann Arbor, MI 48103



LABORATORY OPERATIONS
CASE NARRATIVE

ATS Project Number: **G001-002**
Report Date: **3/28/22**
SRF / SDG Number(s): **0323221**
Client PO Number: **4505179649**

Case Narrative Summary

This case narrative applies to the identified 12 samples that were received at Ann Arbor Technical Services, Inc. (ATS) on 3/23/22, and associated matrix-specific QA/QC:

Client Sample Identification	Sample Date	Requested Turn Around Time	Analysis	Matrix
Perceval 3/23/22				
Charif6 001	3/23/22	Urgent	1,4-Dioxane	Water
Red Pond	3/23/22	Urgent	1,4-Dioxane	Water
Combustion Effluent	3/23/22	Urgent	1,4-Dioxane	Water
FFQC-14	3/23/22	Urgent	1,4-Dioxane	Water
FFQC-15	3/23/22	Urgent	1,4-Dioxane	Water
HW-1	3/23/22	Urgent	1,4-Dioxane	Water
Outfall Crab	3/23/22	Urgent	1,4-Dioxane	Water
Outfall Tree	3/23/22	Urgent	1,4-Dioxane	Water
MSW-564	3/23/22	Standard	1,4-Dioxane	Water
MSW-564	3/23/22	Standard	1,4-Dioxane	Water
MSW-28	3/23/22	Standard	1,4-Dioxane	Water
MSW-91	3/23/22	Standard	1,4-Dioxane	Water

Upon receipt samples were subsampled for the following analyses:

- Analysis
 - 1,4-Dioxane (USEPA 1624) – Urgent TAT
 - 1,4-Dioxane (USEPA 1624) – Standard TAT
- Number of Samples
 - 8 Samples + 1 Matrix Spike + 1 Matrix Spike Duplicate
 - 4 Samples

0301-402.22CN_0323221.doc

Consultant in Chemistry & Environmental Science
200 South Wagner Road, Ann Arbor, Michigan 48103 Tel 734-995-0955 Fax 734-995-0731

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample conditions and anomalies, if any, are either presented in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days of the following exceptions:

- None

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures specified in a written standard operating procedure (SOP) specific to the ATS Laboratory, as required by USEPA. All data are peer and management reviewed to ensure compliance with the above referenced SOPs and project specifications. In addition, all data conforms to the laboratory's Quality Assurance / Quality Control Manuals.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LRB), fortified blanks (FB, LFB, LCS), matrix spikes (MS, SPK), and duplicates whether spiked or native (MSD, SPK DUP, DUP, LK).

Data Qualifications, Specifications, and Technical Narration

The following are qualifier descriptions that may be used throughout this SDG and are presented with their associated samples in each SDG section as appropriate.

- "NT" – exceeds the calibration range of the method
- "D" – result taken from sample dilution
- "P" – concentration reported between the laboratory/instrument determined Method Detection Limit (MDL)/Limit of Detection (LOD), and the Practical Quantitation Limit (PQL)/Limit of Quantitation (LOQ)
- "MDL" – concentration reported below the laboratory/instrument Method Detection Limit (MDL)/Limit of Quantitation (LOQ) and the instrument signal To Noise Ratio (SNR) of approximately 10:1
- "IP" – analyte concentration in method blank exceeds reporting limit
- "A" – analyte not detected above MDL / LOD
- "**" – indicates analyte has exceeded batch or sample specific QA/QC control limits
- "**" – indicates matrix interference
- "T" – indicates ion ratio between 15 and 30 % acceptance window
- "N%" – indicates ion ratio outside 30% acceptance window and result is Not Reported

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LRB), fortified blanks (FB, LFB, LCS), matrix spikes (LPM, MS, SPK), and duplicates whether spiked or native (LPM-D, MSD, SPK DUP, DUP, LK).

Data Deliverables

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA IS ED) are available upon request. There were no hardcopy data summary sheets generated for this project.

0301-402.22CN_0323221.doc



Sample Analysis

1,4-Dioxane Analysis (GC/MS) – Samples were analyzed by purge and trap GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Insolute Distraction Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 1,4-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as ngl/L.

Analysis Notes

Sample Dilutions

Samples containing compounds at concentrations above the initial calibration curve were diluted and reanalyzed for those compounds. The following samples were diluted for 1,4-Dioxane:

- Red Pond 3/23/22

Laboratory Reagent Blanks

A laboratory reagent blank (LRB) was analyzed as part of the QA/QC batch. The LRB met the acceptance criteria with the following exceptions:

- None

Internal Standards and Surrogates – Quantitation

This method utilizes Internal Standards only, not Surrogates. Internal standards areas and retention times met the acceptance criteria with the following exceptions:

- None

ACCURACY

Laboratory Fortified Blanks (LFB/OPR) Laboratory Control Samples – Accuracy

A laboratory identified blank (LFB/OPR) was analyzed as part of the QA/QC batch. The LFB/OPR met the acceptance criteria with the following exceptions:

- None

Matrix Spikes and Matrix Spike Duplicates – Accuracy

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD met the accuracy acceptance criteria with the following exceptions:

- None

PRECISION

Matrix Spike and Matrix Spike Duplicates – Precision

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD met the precision acceptance criteria with the following exceptions:

- None


/ March 28, 2022

Mark T. DeLong (Quality Assurance Coordinator)


/ March 28, 2022

Philip B. Simon (Laboratory Director)

Client Sample Identification	Sample Date	Requested Turn Around Time	Analysis	Matrix	Result	Reporting Limit	Notes
Perceval 3/23/22							
Charif6 001	3/23/22	Urgent	1,4-Dioxane	Water	0.50303 L	0.50303 L	
Red Pond	3/23/22	Urgent	1,4-Dioxane	Water	0.50303 L	0.50303 L	
Combustion Effluent	3/23/22	Urgent	1,4-Dioxane	Water	0.50303 L	0.50303 L	
FFQC-14	3/23/22	Urgent	1,4-Dioxane	Water	0.50303 L	0.50303 L	
FFQC-15	3/23/22	Urgent	1,4-Dioxane	Water	0.50303 L	0.50303 L	
HW-1	3/23/22	Urgent	1,4-Dioxane	Water	0.50303 L	0.50303 L	
Outfall Crab	3/23/22	Urgent	1,4-Dioxane	Water	0.50303 L	0.50303 L	
Outfall Tree	3/23/22	Urgent	1,4-Dioxane	Water	0.50303 L	0.50303 L	
MSW-564	3/23/22	Standard	1,4-Dioxane	Water	0.50303 L	0.50303 L	
MSW-564	3/23/22	Standard	1,4-Dioxane	Water	0.50303 L	0.50303 L	
MSW-28	3/23/22	Standard	1,4-Dioxane	Water	0.50303 L	0.50303 L	
MSW-91	3/23/22	Standard	1,4-Dioxane	Water	0.50303 L	0.50303 L	

CHAIN OF CUSTODY RECORD



ANN ARBOR TECHNICAL SERVICES, INC.
QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY BLANK SUMMARY

Sample No.	Sample Name	Client Name	Client Address	Client Phone	Client Email	Client PO	Client Address	Client Phone	Client Email
0301-402.22CN	0323221	USEPA 1624							
0301-402.22CN	0323221	USEPA 1624							
0301-402.22CN	0323221	USEPA 1624							

0301-402.22CN_0323221.doc

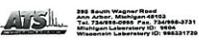


Client	Client Number	Client Name	Client Address	Client City	Client State	Client Zip	Client Contact	Client Phone	Client Fax	Client Email
Ann Arbor (103) / State State (103)	00000001	Ann Arbor	Ann Arbor	MI	48103	00000001				

Client	Client Number	Client Name	Client Address	Client City	Client State	Client Zip	Client Contact	Client Phone	Client Fax	Client Email
Ann Arbor (103) / State State (103)	00000001	Ann Arbor	Ann Arbor	MI	48103	00000001				

Client	Client Number	Client Name	Client Address	Client City	Client State	Client Zip	Client Contact	Client Phone	Client Fax	Client Email
Ann Arbor (103) / State State (103)	00000001	Ann Arbor	Ann Arbor	MI	48103	00000001				

Client	Client Number	Client Name	Client Address	Client City	Client State	Client Zip	Client Contact	Client Phone	Client Fax	Client Email
Ann Arbor (103) / State State (103)	00000001	Ann Arbor	Ann Arbor	MI	48103	00000001				



Data Transmittal Cover Page

Project Name: Pali Corporation
 ATS Project Number: G001-002
 ATS Report Number(s): Inorg_SRF_0324221
 Client PO Number: 4505179649
 Project Description: This data report contains the results of 6 water samples, received by ATS on March 24, 2022 to be analyzed for 1,4 Dioxane.

We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratory, as required by USEPA. Laboratory data sheets, SOPs, and QA/QC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Corge Trondal Email: corge.trondal@pali.com
 FAX Number:

No. of Pages (including cover pg.): 20

From: Sarah Stubbinsfield Email: Sarah.Stubbinsfield@AnnArborTechnicalServices.com
 Sarah Charney / Lab Manager FAX Number: 734-995-3731

Additional Message: Copy report to: Pateman, Kelly (kelly.pateman@pali.com), Brode, Jim (jim.brode@pali.com), Katie Strohbeier (katie.strohbeier@veeva.com), woods@veeva-operations.com, Paters, Sue Paters (sue.paters@pali.com), Amanda Isabella (amanda.isabella@pali.com)

Date: 3/28/22 Signed:

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ORGANIC ANALYSIS
1,4-Dioxane by GC/MS
USEPA 1624

ATS Project Number: G001-002.22
 ATS SDG: 0324221

Prepared By:
 Ann Arbor Technical Services, Inc.
 290 South Wagner Road
 Ann Arbor, MI 48103



LABORATORY OPERATIONS
CASE NARRATIVE

ATS Project Number: G001-002
 Report Date: 3/28/22
 SRF / SDG Number(s): 0324221
 Client PO Number: 4505179649

Case Narrative Summary

This case narrative applies to the following 8 samples that were received at Ann Arbor Technical Services, Inc. (ATS) on 3/24/22, and associated matrix-specific QA/QC.

Client Sample Identification	Sample Date	Requested Turn Around Time	Analysis	Matrix
Recovery 1/24/22				
Chaffell 001	3/24/22	Urgent	1,4-Dioxane	Water
Brad Field	3/24/22	Urgent	1,4-Dioxane	Water
Combustion Effluent	3/24/22	Urgent	1,4-Dioxane	Water
TRCOC-1a	3/24/22	Urgent	1,4-Dioxane	Water
TRCOC-2a	3/24/22	Urgent	1,4-Dioxane	Water
EP-1	3/24/22	Urgent	1,4-Dioxane	Water
Chaffell Clash	3/24/22	Urgent	1,4-Dioxane	Water
Chaffell Test	3/24/22	Urgent	1,4-Dioxane	Water

Upon receipt samples were scheduled for the following analysis:

- Analysis: 1,4-Dioxane (USEPA 1624) - Urgent TAT
- Number of Samples: 8 Samples + 1 Matrix Spike + 1 Matrix Spike Duplicate

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pali Corporation staff. Samples were received with proper chain of custody records included. Sample conditions and anomalies, if any, are either presented in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exceptions:

- None

0901-462.2200-0702021.doc
 Consultation in Chemistry & Environmental Services
 290 South Wagner Road, Ann Arbor, Michigan 48103 Tel 734-995-0995 Fax 734-995-3731

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written standard operating procedure (SOP) specific to the ATS Laboratory, as required by USEPA. All data are peer and management reviewed to ensure compliance with the above referenced SOP's and project specifications. In addition, all data conform to the laboratory's Quality Assurance / Quality Control Manual.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LRB), fortified blanks (IS, LFB, LCS), matrix spikes (MS, SPK), and duplicates (whether spiked or native) (MSD, SPK DUP, DUP, LR).

Data Qualifications, Specifications, and Technical Narration

The following are qualifier descriptions that may be used throughout this SDG and are presented with their associated samples in each SDG section as appropriate.

- "B" - exceeds the calibration range of the method
- "D" - result taken from sample dilution
- "P" - concentration reported between the laboratory/instrument determined Method Detection Limit (MDL)/Limit of Detection (LOD), and the Practical Quantitation Limit (PQL)/Limit of Quantitation (LOQ)
- "MDL*" - concentration reported below the laboratory/instrument Method Detection Limit (MDL)/Limit of Quantitation (LOQ) and the instrument Signal To Noise Ratio (SNR) of approximately 10:1
- "L" - analyte concentration in method blank exceeds reporting limit
- "U" - analyte not detected above MDL / LOD
- "**" - indicates analyte has exceeded batch or sample specific QA/QC control limits
- "M*" - indicates matrix interference
- "***" - indicates ion ratio between 15 and 30% acceptance window
- "N%" - indicates ion ratio outside 30% acceptance window and result is Not Reported

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LRB), fortified blanks (IS, LFB, LCS), matrix spikes (LPM, MS, SPK), and duplicates (whether spiked or native) (LPM/D, MSD, SPK DUP, DUP, LR).

Data Deliverables

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA R5 EDD) are available upon request. There were no history data summary sheets generated for this project.

Sample Analysis

1,4-Dioxane Analysis (GC/MS): Samples were analyzed by purge and trap GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Insulated Dilution Gas Chromatography - Mass Spectrometry). An initial calibration with at least five levels was used to quantify 1,4-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mpf.

Analyst's Note:

0901-462.2200-0702021.doc





ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY BLANK SUMMARY

Method USEPA 1631
QA/QC Batch Number C00R0324221
SOP 634221
Project Number 0001-032.22
Report Date 3/25/2022

Laboratory Reagent Blank (LRB) / Method Blank (MB)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Result, Units, Blank, Method Detection Limit, Reporting Detection Limit, Quarter. Row 1: LRB-1 3/24/22 09:10:42 1,4-Dioxane 12541-7

Comments: All methods require 20 EPA method unless otherwise noted. Methods are performed per the applicable EPA method. All methods are performed per the applicable EPA method. All methods are performed per the applicable EPA method.



CHAIN OF CUSTODY RECORD

Chain of Custody Record table with columns for Sample ID, Date, Time, Location, Name, Signature, and Remarks. Includes handwritten entries for sample LRB-1.

* Requested Turn-Around Time Priority Number Key: 1 = Urgent 2 = Rush 3 = Standard

PRECISION

Matrix Spike and Matrix Spike Duplicate - Precision. A matrix spike (MS) and matrix spike duplicate (MSD) were analyzed as part of the QA/QC batch. The MS/MSD met the precision acceptance criteria with the following exceptions:

Signature: Mark T. DeLong (Quality Assessment Coordinator) dated 3/28/2022. Signature: Philip H. Simon (Laboratory Director) dated 3/28/2022.

Sample Dilutions

Sample containing components at concentrations above the initial calibration curve were diluted and reanalyzed for these components. The following samples were diluted for 1/10 dilution:

Laboratory Reagent Blanks

A laboratory reagent blank (LRB) was analyzed as part of the QA/QC batch. The LRB met the acceptance criteria with the following exceptions:

Internal Standards and Surrogates - Quantification

The internal standards and surrogates were analyzed as part of the QA/QC batch. The internal standards and surrogates met the acceptance criteria with the following exceptions:

ACCURACY

Laboratory Fortified Blanks (LFB) / Laboratory Control Sample (LCS) / Laboratory Control Sample (LCS) - Accuracy

A laboratory fortified blank (LFB) was analyzed as part of the QA/QC batch. The LFB/OPR met the accuracy acceptance criteria with the following exceptions:

Matrix Spike and Matrix Spike Duplicate - Accuracy

A matrix spike (MS) and matrix spike duplicate (MSD) were analyzed as part of the QA/QC batch. The MS/MSD met the accuracy acceptance criteria with the following exceptions:

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY PRECISION SUMMARY

Method USEPA 1631
QA/QC Batch Number C00R0324221
SOP 634221
Project Number 0001-032.22
Report Date 3/25/2022

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Result, Units, Blank, Method Detection Limit, Reporting Detection Limit, Quarter. Row 1: MS-1 3/24/22 17:27:41 1,4-Dioxane 12541-7

Comments: All methods require 20 EPA method unless otherwise noted. Methods are performed per the applicable EPA method. All methods are performed per the applicable EPA method. All methods are performed per the applicable EPA method.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method USEPA 1631
QA/QC Batch Number C00R0324221
SOP 634221
Project Number 0001-032.22
Report Date 3/25/2022

Matrix Spike Duplicate (MSD)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Blank, Percent Recovery, LCL, UCL, Quarter. Row 1: MSD-1 3/24/22 17:27:41 1,4-Dioxane 12541-7

Comments: All methods require 20 EPA method unless otherwise noted. Methods are performed per the applicable EPA method. All methods are performed per the applicable EPA method. All methods are performed per the applicable EPA method.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method USEPA 1631
QA/QC Batch Number C00R0324221
SOP 634221
Project Number 0001-032.22
Report Date 3/25/2022

Matrix Spike (MS)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Blank, Percent Recovery, LCL, UCL, Quarter. Row 1: MS-1 3/24/22 17:27:41 1,4-Dioxane 12541-7

Comments: All methods require 20 EPA method unless otherwise noted. Methods are performed per the applicable EPA method. All methods are performed per the applicable EPA method. All methods are performed per the applicable EPA method.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method USEPA 1631
QA/QC Batch Number C00R0324221
SOP 634221
Project Number 0001-032.22
Report Date 3/25/2022

Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS) / On-Going Precision and Accuracy (OPR)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Blank, Percent Recovery, LCL, UCL, Quarter. Row 1: LFB-1 3/24/22 08:28:52 1,4-Dioxane 12541-7

Comments: All methods require 20 EPA method unless otherwise noted. Methods are performed per the applicable EPA method. All methods are performed per the applicable EPA method. All methods are performed per the applicable EPA method.

Data Transmittal Cover Page

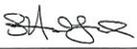
Project Name: Pall Corporation
 Project Number: G001-002
 ATS Report Number(s): Inorg_SRF_0325221
 Client PO Number: 4505179643
 Project Description: This data report contains the results of 1 water sample, received by ATS on March 25, 2022 to be analyzed for 1,4-Dioxane.

We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratory, as required by USEPA. Laboratory data sheets, SOPs, and QA/QC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Gage Trendel Email: gage_trendel@pall.com
 FAX Number:

No. of Pages (including cover pg.): 18
 From: Sarah Stubbelfield Email: Sarah.Stubbelfield@AnnArborTechnicalServices.com
 Senior Chemist / Lab Manager FAX Number: 734-995-3731

Additional Message: Copy report to: Patterson, Keith (keith_patterson@pall.com), Brode, Jim (jim_brode@pall.com)
 Katie Straubauer (kstraubauer@eng.com), woods@tk-operations.com, Peters, Suso Peters (suso_peters@pall.com)
 Amanda Isabella (amanda_isabella@pall.com)

Date: 3/28/22 Signed: 

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4/20/21 002 270448_Trendel_Cover_Page_SLS.doc

ORGANIC ANALYSIS
1,4-Dioxane by GC/MS
USEPA 1624

ATS Project Number: G001-002.22
 ATS SDG: 0325221

Prepared By:
 Ann Arbor Technical Services, Inc.
 200 South Wagner Road
 Ann Arbor, MI 48103

LABORATORY OPERATIONS
 CASE NARRATIVE

ATS Project Number: G001-002
 Report Date: 3/28/22
 SRF / SDG Number(s): 0325221
 Client PO Number: 4505179643

Case Narrative Summary

This case narrative applies to the following 1 sample that was received at Ann Arbor Technical Services, Inc. (ATS) on 3/25/22, and associated matrix-specific QA/QC:

Client Sample Identification	Sample Date	Requested Turn Around Time	Analysis	Matrix
Received 3/25/22 Outfall 001	3/24/22	Urgent	1,4-Dioxane	Water

Upon receipt samples were scheduled for the following analyses:

- Analysis: 1,4-Dioxane (USEPA 1624) - Urgent TAT
- Number of Samples: 1 Sample + 1 Matrix Spike + 1 Matrix Spike Duplicate

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample condition and anomalies, if any, are either presented in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exceptions:

- None

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in the written standard operating procedure (SOP) specific to the ATS Laboratory, as required by USEPA. All data are peer and management reviewed to ensure compliance with the above referenced SOP's and project specifications. In addition, all data conform to the laboratory's Quality Assurance / Quality Control Manual.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LRB), fortified blanks (IS, LFB, LCS), matrix spikes (MS, SPK), and duplicates (whether spiked or naive) (MSD, SPK DUP, DUP, LR).

G001-002.22CN_0325221.doc

Continued in Chemistry & Environmental Science
 200 South Wagner Road, Ann Arbor, Michigan 48103 | Tel 734.995.9999 Fax 734.995.3731

Data Qualifications, Specifications, and Technical Narration

The following are qualifier descriptions that may be used throughout this SDG and are presented with their associated samples in each SDG section as appropriate:

- "E" - exceeds the calibration range of the method
- "D" - result taken from sample dilution
- "P" - concentration reported between the laboratory/instrument determined Method Detection Limit (MDL)/Limit Of Detection (LOD), and the Practical Quantitation Limit (PQL)/Limit Of Quantitation (LOQ)
- "MDL" - concentration reported below the laboratory/instrument Method Detection Limit (MDL)/Limit Of Quantitation (LOQ) and the instrument Signal To Noise Ratio (SNR) of approximately 10:1
- "B" - analyte concentration in method blank exceeds reporting limit
- "T" - analyte not detected above MDL/LOQ
- "H" - indicates analyte has exceeded batch or sample specific QA/QC control limits
- "M" - indicates matrix interference
- "S" - indicates ion ratio between 15 and 30% acceptance window
- "NR" - indicates ion ratio outside 30% acceptance window and result is Not Reported

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LRB), fortified blanks (IS, LFB, LCS), matrix spikes (LPM, MS, SPK), and duplicates (whether spiked or naive) (LPM, MSD, SPK DUP, DUP, LR).

Data Deliverables

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, IFA R5 EDD) are available upon request. There were no laboratory data summary sheets generated for this project.

Sample Analysis

1,4-Dioxane Analysis (GC/MS): Samples were analyzed by purge and trap GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Heated Dilution Gas Chromatography - Mass Spectrometry). An initial calibration with at least five levels was used to quantify 1,4-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Anomalous Note:

Sample Dilutions

Samples containing compounds at concentrations where the initial calibration curve were diluted and reanalyzed for those compounds. The following samples were diluted for 1,4-Dioxane:

- None

G001-002.22CN_0325221.doc



Internal Standards and Surrogates - Quantitation

This method utilizes Internal Standards and Surrogates. Internal standards areas and retention times meet the acceptance criteria with the following exceptions:

- None

ACCURACY

Laboratory Fortified Blanks (LFB/OFR) Laboratory Control Samples - Accuracy

A laboratory fortified blank (LFB/OFR) was analyzed as part of the QA/QC batch. The LFB/OFR met the acceptance criteria with the following exceptions:

- None

Matrix Spikes and Matrix Spike Duplicates - Accuracy

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD met the acceptance criteria with the following exceptions:

- None

PRECISION

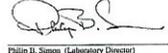
Matrix Spike and Matrix Spike Duplicates - Precision

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD met the precision acceptance criteria with the following exceptions:

- None


 / March 28, 2022

Mark T. DeLong (Quality Assurance Coordinator)


 / March 28, 2022

Philip D. Simms (Laboratory Director)



G001-002.22CN_0325221.doc

Requested Turn-Around Time Priority Number Key: 1=Urgent, 2=Status, 3=Standard

DATE	TIME	ANALYST	CLIENT	PROJECT	DESCRIPTION	STATUS	REMARKS
3/25/22	10:00 AM	JIM BRADLEY	PALL CORPORATION	OUTFALL 001	1,4-DIOXANE	1	RECEIVED
3/25/22	11:00 AM	SARAH STUBBELFIELD	PALL CORPORATION	OUTFALL 001	1,4-DIOXANE	1	PREPARED
3/25/22	12:00 PM	SARAH STUBBELFIELD	PALL CORPORATION	OUTFALL 001	1,4-DIOXANE	1	ANALYZED
3/25/22	1:00 PM	SARAH STUBBELFIELD	PALL CORPORATION	OUTFALL 001	1,4-DIOXANE	1	REPORTED
3/25/22	2:00 PM	SARAH STUBBELFIELD	PALL CORPORATION	OUTFALL 001	1,4-DIOXANE	1	REVIEWED
3/25/22	3:00 PM	SARAH STUBBELFIELD	PALL CORPORATION	OUTFALL 001	1,4-DIOXANE	1	FINAL



CHAIN OF CUSTODY RECORD

Jim Bradley

From: Trendel, Gage <gage_trendel@pall.com>
 Sent: Friday, March 25, 2022 10:51 AM
 To: Jim Bradley; Sarah Stubbelfield; Mark DeLong
 Cc: David Stubbelfield
 Subject: RE: Pall eDOC 3/25/2022

The Outfall was collected 3/24.

Gage Trendel
 Chemist
 FLV OPERATIONS AND RESOURCE MANAGEMENT, INC.
 842 S. Wagner Road | Ann Arbor | MI 48103
 O: 616.977.1000 | D: 416.787.5144 | F: 616.977.1005

Confidential - Company Property

From: Jim Bradley <jim.bradley@annarbortechnicalservices.com>
 Sent: Friday, March 25, 2022 10:22 AM
 To: Trendel, Gage <gage_trendel@pall.com>; Sarah Stubbelfield <Sarah.Stubbelfield@annarbortechnicalservices.com>; Mark DeLong <Mark.DeLong@annarbortechnicalservices.com>; David Stubbelfield <David.Stubbelfield@annarbortechnicalservices.com>
 Cc: David Stubbelfield <David.Stubbelfield@annarbortechnicalservices.com>; Jim Bradley <jim.bradley@annarbortechnicalservices.com>
 Subject: RE: Pall eDOC 3/25/2022

Gage, The sample today has a sample date of 3/25/22 the CDC has a sample date of 3/24/22 which would you like to use?

From: Trendel, Gage <gage_trendel@pall.com>
 Sent: Friday, March 25, 2022 9:45 AM
 To: Sarah Stubbelfield <Sarah.Stubbelfield@annarbortechnicalservices.com>; Mark DeLong <Mark.DeLong@annarbortechnicalservices.com>; David Stubbelfield <David.Stubbelfield@annarbortechnicalservices.com>; Jim Bradley <jim.bradley@annarbortechnicalservices.com>
 Subject: RE: Pall eDOC 3/25/2022

Gage Trendel
 Chemist
 FLV OPERATIONS AND RESOURCE MANAGEMENT, INC.
 842 S. Wagner Road | Ann Arbor | MI 48103
 O: 616.977.1000 | D: 416.787.5144 | F: 616.977.1005

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ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method:	USEPA 1631
QA/QC Batch Number:	00090320221
SO:	032021
Project Number:	0001-002.02
Report Date:	3/23/2022

Lab Sample ID	Analysis Date	Analysis Time	Chemical Name	CAS	Sample Concentration	Units	Recovery	Percent Recovery	LCL	UCL	Qualifier
1019-1-02502	03/23/2022	08:42:07	1,4-Dioxane	123-91-1	0.170	0.0041	101	94.1	85	115	

Comments:
 1. Method recovery is 97.4% (within 90-100% range).
 2. Recovery is 94.1% (within 80-100% range).
 3. Percent recovery is 94.1% (within 80-100% range).
 4. Values are based on the total dry weight of sample.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY PRECISION SUMMARY

Method:	USEPA 1631
QA/QC Batch Number:	00090320221
SO:	032021
Project Number:	0001-002.02
Report Date:	3/23/2022

Lab Sample ID	Analysis Date	Analysis Time	Chemical Name	CAS	Sample Concentration	Units	Recovery	Percent Recovery	LCL	UCL	Qualifier
1019-1-02502	03/23/2022	08:42:07	1,4-Dioxane	123-91-1	0.170	0.0041	101	94.1	85	115	

Comments:
 1. Method recovery is 97.4% (within 90-100% range).
 2. Recovery is 94.1% (within 80-100% range).
 3. Percent recovery is 94.1% (within 80-100% range).
 4. Values are based on the total dry weight of sample.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY BLANK SUMMARY

Method:	USEPA 1631
QA/QC Batch Number:	00090320221
SO:	032021
Project Number:	0001-002.02
Report Date:	3/23/2022

Lab Sample ID	Analysis Date	Analysis Time	Chemical Name	CAS	Result	Units	Method Detection Limit	Reporting Detection Limit	Qualifier
1019-1-02502	03/23/2022	09:27:09	1,4-Dioxane	123-91-1		µg/L	0.201		

Comments:
 1. Method recovery is 97.4% (within 90-100% range).
 2. Recovery is 94.1% (within 80-100% range).
 3. Percent recovery is 94.1% (within 80-100% range).
 4. Values are based on the total dry weight of sample.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY PRECISION SUMMARY

Method:	USEPA 1631
QA/QC Batch Number:	00090320221
SO:	032021
Project Number:	0001-002.02
Report Date:	3/23/2022

Lab Sample ID	Analysis Date	Analysis Time	Chemical Name	CAS	Result	Units	Method Detection Limit	Reporting Detection Limit	Qualifier
1019-1-02502	03/23/2022	09:27:09	1,4-Dioxane	123-91-1		µg/L	0.201		

Comments:
 1. Method recovery is 97.4% (within 90-100% range).
 2. Recovery is 94.1% (within 80-100% range).
 3. Percent recovery is 94.1% (within 80-100% range).
 4. Values are based on the total dry weight of sample.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method:	USEPA 1631
QA/QC Batch Number:	00090320221
SO:	032021
Project Number:	0001-002.02
Report Date:	3/23/2022

Lab Sample ID	Analysis Date	Analysis Time	Chemical Name	CAS	Sample Concentration	Units	Recovery	Percent Recovery	LCL	UCL	Qualifier
1019-1-02502	03/23/2022	10:27:22	1,4-Dioxane	123-91-1	0.170	0.0041	101	94.1	85	115	

Comments:
 1. Method recovery is 97.4% (within 90-100% range).
 2. Recovery is 94.1% (within 80-100% range).
 3. Percent recovery is 94.1% (within 80-100% range).
 4. Values are based on the total dry weight of sample.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method:	USEPA 1631
QA/QC Batch Number:	00090320221
SO:	032021
Project Number:	0001-002.02
Report Date:	3/23/2022

Lab Sample ID	Analysis Date	Analysis Time	Chemical Name	CAS	Sample Concentration	Units	Recovery	Percent Recovery	LCL	UCL	Qualifier
1019-1-02502	03/23/2022	10:27:22	1,4-Dioxane	123-91-1	0.170	0.0041	101	94.1	85	115	

Comments:
 1. Method recovery is 97.4% (within 90-100% range).
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 3. Percent recovery is 94.1% (within 80-100% range).
 4. Values are based on the total dry weight of sample.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method:	USEPA 1631
QA/QC Batch Number:	00090320221
SO:	032021
Project Number:	0001-002.02
Report Date:	3/23/2022

Lab Sample ID	Analysis Date	Analysis Time	Chemical Name	CAS	Sample Concentration	Units	Recovery	Percent Recovery	LCL	UCL	Qualifier
1019-1-02502	03/23/2022	10:48:37	1,4-Dioxane	123-91-1	0.170	0.0041	101	94.1	85	115	

Comments:
 1. Method recovery is 97.4% (within 90-100% range).
 2. Recovery is 94.1% (within 80-100% range).
 3. Percent recovery is 94.1% (within 80-100% range).
 4. Values are based on the total dry weight of sample.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method:	USEPA 1631
QA/QC Batch Number:	00090320221
SO:	032021
Project Number:	0001-002.02
Report Date:	3/23/2022

Lab Sample ID	Analysis Date	Analysis Time	Chemical Name	CAS	Sample Concentration	Units	Recovery	Percent Recovery	LCL	UCL	Qualifier
1019-1-02502	03/23/2022	10:48:37	1,4-Dioxane	123-91-1	0.170	0.0041	101	94.1	85	115	

Comments:
 1. Method recovery is 97.4% (within 90-100% range).
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ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method:	USEPA 1631
QA/QC Batch Number:	00090320221
SO:	032021
Project Number:	0001-002.02
Report Date:	3/23/2022

Lab Sample ID	Analysis Date	Analysis Time	Chemical Name	CAS	Sample Concentration	Units	Recovery	Percent Recovery	LCL	UCL	Qualifier
1019-1-02502	03/23/2022	10:48:37	1,4-Dioxane	123-91-1	0.170	0.0041	101	94.1	85	115	

Comments:
 1. Method recovery is 97.4% (within 90-100% range).
 2. Recovery is 94.1% (within 80-100% range).
 3. Percent recovery is 94.1% (within 80-100% range).
 4. Values are based on the total dry weight of sample.

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Fax: 248-850-2275

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200 South Western Road
Ann Arbor, Michigan 48106

Office: 248-850-0905
Fax: 248-850-2275

Ann Arbor Technical Services, Inc.
200 South Western Road
Ann Arbor, Michigan 48106



1,4-Dioxane by GC/MS Data Summary Sheet

ATS Project Number	0801-002-22	Percent Moisture	100.0
ATS SDO Number	0321221	Instrument	2100V
Client Sample ID	MSW-105	Subsample (mL)	5.000
Laboratory Sample ID	0321221-2	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	40
Sample Date	03/19/2012 F16	Batch	Wat
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/21/2012
QC Batch Number	QC080622221	Analysis Date	03/21/2012 14:01:36

Parameter	CAS#	Result	MCL	PQL	Qual
1,4-Dioxane	123-91-1	0.44	0.04		M

Comments:
All methods reference 16311A methods unless otherwise noted.
Calibration performed per 8150.0.
Method compliance verified per 8150.0.
Project Sample Reporting per 8150.0. (Blank spot based calibration method).
No detection observed reporting per 8150.0 spot sample detection.

Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103

Office: 734-995-0395
Fax: 734-995-3721



1,4-Dioxane by GC/MS Data Summary Sheet

ATS Project Number	0801-002-22	Percent Moisture	100.0
ATS SDO Number	0321221	Instrument	2100V
Client Sample ID	MSW-105	Subsample (mL)	5.000
Laboratory Sample ID	0321221-6	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	40
Sample Date	03/19/2012 11:11	Batch	Wat
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/21/2012
QC Batch Number	QC080622121	Analysis Date	03/21/2012 20:30:58

Parameter	CAS#	Result	MCL	PQL	Qual
1,4-Dioxane	123-91-1	2.5	0.04		M

Comments:
All methods reference 16311A methods unless otherwise noted.
Calibration performed per 8150.0.
Method compliance verified per 8150.0.
Project Sample Reporting per 8150.0. (Blank spot based calibration method).
No detection observed reporting per 8150.0 spot sample detection.

Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103

Office: 734-995-0395
Fax: 734-995-3721



1,4-Dioxane by GC/MS Data Summary Sheet

ATS Project Number	0801-002-22	Percent Moisture	100.0
ATS SDO Number	0321221	Instrument	2100V
Client Sample ID	MSW-22	Subsample (mL)	5.000
Laboratory Sample ID	0321221-19	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	40
Sample Date	03/19/2012 13:30	Batch	Wat
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/21/2012
QC Batch Number	QC080622121	Analysis Date	03/21/2012 12:38:12

Parameter	CAS#	Result	MCL	PQL	Qual
1,4-Dioxane	123-91-1	2.0	0.04		M

Comments:
All methods reference 16311A methods unless otherwise noted.
Calibration performed per 8150.0.
Method compliance verified per 8150.0.
Project Sample Reporting per 8150.0. (Blank spot based calibration method).
No detection observed reporting per 8150.0 spot sample detection.

Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103

Office: 734-995-0395
Fax: 734-995-3721



1,4-Dioxane by GC/MS Data Summary Sheet

ATS Project Number	0801-002-22	Percent Moisture	100.0
ATS SDO Number	0321221	Instrument	2100V
Client Sample ID	Outlet	Subsample (mL)	5.000
Laboratory Sample ID	032221-1	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/21/2012 AJ	Batch	Wat
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/21/2012
QC Batch Number	QC080622221	Analysis Date	03/22/2012 10:30:47

Parameter	CAS#	Result	MCL	PQL	Qual
1,4-Dioxane	123-91-1	0.006	0.001		M

Comments:
All methods reference 16311A methods unless otherwise noted.
Calibration performed per 8150.0.
Method compliance verified per 8150.0.
Project Sample Reporting per 8150.0. (Blank spot based calibration method).
No detection observed reporting per 8150.0 spot sample detection.

Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103

Office: 734-995-0395
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1,4-Dioxane by GC/MS Data Summary Sheet

ATS Project Number	0801-002-22	Percent Moisture	100.0
ATS SDO Number	0321221	Instrument	2100V
Client Sample ID	MSW-105	Subsample (mL)	5.000
Laboratory Sample ID	032221-6	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/21/2012 9:02	Batch	Wat
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/21/2012
QC Batch Number	QC080622221	Analysis Date	03/22/2012 19:21:01

Parameter	CAS#	Result	MCL	PQL	Qual
1,4-Dioxane	123-91-1	ND	0.001		U

Comments:
All methods reference 16311A methods unless otherwise noted.
Calibration performed per 8150.0.
Method compliance verified per 8150.0.
Project Sample Reporting per 8150.0. (Blank spot based calibration method).
No detection observed reporting per 8150.0 spot sample detection.

Ann Arbor Technical Services, Inc.
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1,4-Dioxane by GC/MS Data Summary Sheet

ATS Project Number	0801-002-22	Percent Moisture	100.0
ATS SDO Number	0321221	Instrument	2100V
Client Sample ID	373 Phoenix 22	Subsample (mL)	5.000
Laboratory Sample ID	032221-19	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/21/2012 11:06	Batch	Wat
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/22/2012
QC Batch Number	QC080622221	Analysis Date	03/22/2012 20:04:51

Parameter	CAS#	Result	MCL	PQL	Qual
1,4-Dioxane	123-91-1	ND	0.001		U

Comments:
All methods reference 16311A methods unless otherwise noted.
Calibration performed per 8150.0.
Method compliance verified per 8150.0.
Project Sample Reporting per 8150.0. (Blank spot based calibration method).
No detection observed reporting per 8150.0 spot sample detection.

Ann Arbor Technical Services, Inc.
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Office: 734-995-0395
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1,4-Dioxane by GC/MS Data Summary Sheet

ATS Project Number	0801-002-22	Percent Moisture	100.0
ATS SDO Number	0321221	Instrument	2100V
Client Sample ID	Outlet	Subsample (mL)	5.000
Laboratory Sample ID	032221-1	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	03/21/2012 nd	Batch	Wat
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	03/21/2012
QC Batch Number	QC080622221	Analysis Date	03/22/2012 10:30:46

Parameter	CAS#	Result	MCL	PQL	Qual
1,4-Dioxane	123-91-1	0.006	0.001		M

Comments:
All methods reference 16311A methods unless otherwise noted.
Calibration performed per 8150.0.
Method compliance verified per 8150.0.
Project Sample Reporting per 8150.0. (Blank spot based calibration method).
No detection observed reporting per 8150.0 spot sample detection.

Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103

Office: 734-995-0395
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1,4-Dioxane by GC/MS
Data Summary Sheet

Method: 8150.0
Sample ID: 0321221-2
Final Volume: 5.000 mL
Dilution Factor: 40
Batch: Wat
Date: 03/19/2012

Analysis Date: 03/21/2012 14:01:36

QC Batch Number: QC080622221

Result: 0.44 mg/L

MCL: 0.04 mg/L

PQL: N/A

Qual: M

1,4-Dioxane by GC/MS
Data Summary Sheet

Method: 8150.0
Sample ID: 0321221-6
Final Volume: 5.000 mL
Dilution Factor: 40
Batch: Wat
Date: 03/19/2012

Analysis Date: 03/21/2012 20:30:58

QC Batch Number: QC080622121

Result: 2.5 mg/L

MCL: 0.04 mg/L

PQL: N/A

Qual: M

1,4-Dioxane by GC/MS
Data Summary Sheet

Method: 8150.0
Sample ID: MSW-22
Final Volume: 5.000 mL
Dilution Factor: 40
Batch: Wat
Date: 03/19/2012

Analysis Date: 03/21/2012 12:38:12

QC Batch Number: QC080622121

Result: 2.0 mg/L

MCL: 0.04 mg/L

PQL: N/A

Qual: M

1,4-Dioxane by GC/MS
Data Summary Sheet

Method: 8150.0
Sample ID: Outlet
Final Volume: 5.000 mL
Dilution Factor: 1
Batch: Wat
Date: 03/21/2012

Analysis Date: 03/22/2012 10:30:47

QC Batch Number: QC080622221

Result: 0.006 mg/L

MCL: 0.001 mg/L

PQL: N/A

Qual: M

1,4-Dioxane by GC/MS
Data Summary Sheet

Method: 8150.0
Sample ID: 032221-6
Final Volume: 5.000 mL
Dilution Factor: 1
Batch: Wat
Date: 03/21/2012

Analysis Date: 03/22/2012 19:21:01

QC Batch Number: QC080622221

Result: ND

MCL: 0.001 mg/L

PQL: N/A

Qual: U

1,4-Dioxane by GC/MS
Data Summary Sheet

Method: 8150.0
Sample ID: 373 Phoenix 22
Final Volume: 5.000 mL
Dilution Factor: 1
Batch: Wat
Date: 03/21/2012

Analysis Date: 03/22/2012 20:04:51

QC Batch Number: QC080622221

Result: ND

MCL: 0.001 mg/L

PQL: N/A

Qual: U

1,4-Dioxane by GC/MS
Data Summary Sheet

Method: 8150.0
Sample ID: Outlet
Final Volume: 5.000 mL
Dilution Factor: 1
Batch: Wat
Date: 03/21/2012

Analysis Date: 03/22/2012 10:30:46

QC Batch Number: QC080622221

Result: 0.006 mg/L

MCL: 0.001 mg/L

PQL: N/A

Qual: M



Data Transmittal Cover Page

Project Name: Pali Corporation
 ATS Project Number: G001-002
 ATS Report Number(s): Inorg_SRF_0328221
 Client PO Number: 4505179649
 Project Description: This data report contains the results of 8 water sample, received by ATS on March 28, 2022 to be analyzed for 1,4 Dioxane.

We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratory, as required by USEPA. Laboratory data sheets, SOPs, and QA/QC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Gage Trendel Email: gage.trendel@pali.com
 FAX Number:

No. of Pages (including cover pg.): 20
 From: Sarah Shubeloff Email: Sarah.Shubeloff@AnnArborTechnicalServices.com
 Senior Chemist / Lab Manager FAX Number: 734-655-3731

Additional Message: Copy report to: Pattenam, Keith (Keith.pattenam@pali.com), Brode, Jim (Jim.brode@pali.com)
 Katie Strubauer (katiestrubauer@evng.com), rewoods@in-operations.com, Paters, Sue Peters (sue.peters@pali.com)
 Amanda Isabella (amanda.isabella@pali.com)

Date: 4/4/22 Signed:

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LABORATORY OPERATIONS
CASE NARRATIVE

ATS Project Number: G001-002
 Report Date: 4/4/22
 SRF / SDG Number(s): 0328221
 Client PO Number: 4505179649

Case Narrative Summary

This case narrative applies to the following 8 samples that was received at Ann Arbor Technical Services, Inc. (ATS) on 3/28/22, and associated matrix-specific QA/QC:

Client Sample Identification	Sample Date	Requested Turn Around Time	Analysis	Matrix
Revised 3/28/22				
Outfall Eff	3/27/22	Urgent	1,4-Dioxane	Water
Red Pond	3/28/22	Urgent	1,4-Dioxane	Water
Combustion Effluent	3/28/22	Urgent	1,4-Dioxane	Water
FIB-OC-1a	3/28/22	Urgent	1,4-Dioxane	Water
FIB-OC-2a	3/28/22	Urgent	1,4-Dioxane	Water
MSL	3/28/22	Urgent	1,4-Dioxane	Water
Outfall Chab	3/27/22	Urgent	1,4-Dioxane	Water
Outfall Test	3/28/22	Urgent	1,4-Dioxane	Water

Upon receipt samples were scheduled for the following analysis:

- Analysis: 1,4-Dioxane (USEPA 1631) - Urgent TAT
 Number of Samples: 8 Samples = 1 Matrix Spike + 1 Matrix Spike Duplicate

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pali Corporation staff. Samples were received with proper chain of custody records included. Sample conditions and anomalies, if any, are either presented in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exceptions:

- None

0981-002-22-CN_012021.dwg

Compliance in Chemistry & Environmental Services
 290 South Wagner Road, Ann Arbor, Michigan 48103 Tel 734-995-0995 Fax 734-995-0731

ORGANIC ANALYSIS
1,4-Dioxane by GC/MS
USEPA 1624

ATS Project Number: G001-002.22
 ATS SDG: 0328221

Prepared By:
Ann Arbor Technical Services, Inc.
290 South Wagner Road
Ann Arbor, MI 48103

Sample Dilutions

Samples containing compounds at concentrations above the initial calibration curve were diluted and reanalyzed for those compounds. The following samples were diluted for 1,4-Dioxane:

- Red Pond 3/28/22

Internal Standards and Surrogates - Quantitation

This method utilizes Internal Standards only, not Surrogates. Internal standards areas and retention times meet the acceptance criteria with the following exceptions:

- None

ACCURACY

Laboratory Verified Blanks (LFB/OPR) Laboratory Control Samples - Accuracy

A laboratory verified blank (LFB/OPR) was analyzed as part of the QA/QC batch. The LFB/OPR met the acceptance criteria with the following exceptions:

- None

Matrix Spikes and Matrix Spike Duplicates - Accuracy

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD met the accuracy acceptance criteria with the following exceptions:

- None

PRECISION

Matrix Spike and Matrix Spike Duplicates - Precision

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD met the precision acceptance criteria with the following exceptions:

- None

/ April 4, 2022
Mark T. DeLong (Quality Assurance Coordinator)

/ April 4, 2022
Philip H. Simen (Laboratory Director)

0981-002-22-CN_012021.dwg



0981-002-22-CN_012021.dwg



* Requested Turn Around Time Priority Number Key: 1 = Urgent 2 = Rush 3 = Standard

Client Sample ID	Sample Date	Requested Turn Around Time	Analysis	Matrix	Prepared By	Analyzed By	QC'd By	Released By	Released Date
0328221-1	3/27/22	Urgent	1,4-Dioxane	Water	MSL	MSL	MSL	MSL	4/4/22
0328221-2	3/28/22	Urgent	1,4-Dioxane	Water	MSL	MSL	MSL	MSL	4/4/22
0328221-3	3/28/22	Urgent	1,4-Dioxane	Water	MSL	MSL	MSL	MSL	4/4/22
0328221-4	3/28/22	Urgent	1,4-Dioxane	Water	MSL	MSL	MSL	MSL	4/4/22
0328221-5	3/28/22	Urgent	1,4-Dioxane	Water	MSL	MSL	MSL	MSL	4/4/22
0328221-6	3/28/22	Urgent	1,4-Dioxane	Water	MSL	MSL	MSL	MSL	4/4/22
0328221-7	3/28/22	Urgent	1,4-Dioxane	Water	MSL	MSL	MSL	MSL	4/4/22
0328221-8	3/28/22	Urgent	1,4-Dioxane	Water	MSL	MSL	MSL	MSL	4/4/22

CHAIN OF CUSTODY RECORD

LABORATORY RECEIPT

ANN ARBOR TECHNICAL SERVICES, INC.
 QUALITY ASSURANCE/QUALITY CONTROL SUMMARY
 LABORATORY BLANK SUMMARY

Project: G001-002
 Client Sample Number: G001-002
 Project Name: 4505179649

Laboratory Receipt Blank (RBL) / Ambient Blank (AB)

Lab. No.	Analysis	Retention Time	Concentration	Units	Method	Standard	Concentration	Units	Method
12345	1,4-Dioxane	1.234	0.000	µg/L	GC/MS	1,4-Dioxane	0.000	µg/L	GC/MS

Signature:

Date: 4/4/22





ANN ARBOR TECHNICAL SERVICES, INC.
QUALITY ASSURANCE/QUALITY CONTROL SUMMARY
LABORATORY PRECISION SUMMARY

Method	Method Name	Operator	Sample No.	Sample Date	Sample Type	Sample Location	Sample Description	Sample Matrix	Sample Volume	Sample Weight	Sample Concentration	Sample Recovery	Sample Precision	Sample Accuracy
MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS



ANN ARBOR TECHNICAL SERVICES, INC.
QUALITY ASSURANCE/QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method	Method Name	Operator	Sample No.	Sample Date	Sample Type	Sample Location	Sample Description	Sample Matrix	Sample Volume	Sample Weight	Sample Concentration	Sample Recovery	Sample Accuracy
MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS



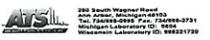
ANN ARBOR TECHNICAL SERVICES, INC.
QUALITY ASSURANCE/QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method	Method Name	Operator	Sample No.	Sample Date	Sample Type	Sample Location	Sample Description	Sample Matrix	Sample Volume	Sample Weight	Sample Concentration	Sample Recovery	Sample Accuracy
MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS



ANN ARBOR TECHNICAL SERVICES, INC.
QUALITY ASSURANCE/QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method	Method Name	Operator	Sample No.	Sample Date	Sample Type	Sample Location	Sample Description	Sample Matrix	Sample Volume	Sample Weight	Sample Concentration	Sample Recovery	Sample Accuracy
MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS	MS/MS



Data Transmittal Cover Page

Project Name: Pall Corporation
 ATS Project Number: G001-002
 ATS Report Number(s): Inorg_SRF_0329221
 Client PO Number: 4505179648
 Project Description: This data report contains the results of 10 water samples, received by AT&S on March 29, 2022 to be analyzed for 1,4 Dioxane.

We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the AT&S Laboratories, as required by USEPA. Laboratory data sheets, SOPs, and QA/QC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Gary Trendl Email: gary.trendl@pall.com
 FAX Number:

No. of Pages (including cover pg.): 22

From: Sarah Subbittfield Email: Sarah.Subbittfield@AnnArborTechnicalServices.com
 Senior Chemist / Lab Manager FAX Number: 734-995-3731

Additional Message: Copy report to: Patterson, Keith (keith_patterson@pall.com), Brode, Jim (jim_brode@pall.com), Kaito (skaito@retschawerdtvent.com), nwoods@lv-operations.com, Peters, Sue (sue_peters@pall.com), Amanda Isabella (amanda_isabella@pall.com)

Date: 4/4/22 Signed:

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ORGANIC ANALYSIS
1,4-Dioxane by GC/MS
USEPA 1624

ATS Project Number: G001-002.22
 ATS SDG: 0329221

Prepared By:
Ann Arbor Technical Services, Inc.
290 South Wagner Road
Ann Arbor, MI 48103



LABORATORY OPERATIONS
CASE NARRATIVE

ATS Project Number: G001-002
 Report Date: 4/4/22
 SRF / SDG Number(s): 0329221
 Client PO Number: 4505179649

Case Narrative Summary
 This case narrative applies to the following 10 samples that was received at Ann Arbor Technical Services, Inc. (AT&S) on 3/29/22, and associated matrix-specific QA/QC:

Client Sample Identification	Sample Date	Requested Turn Around Time	Analysis	Matrix
Outfall 001	3/29/22	Urgent	1,4-Dioxane	Water
Reel Pond	3/29/22	Urgent	1,4-Dioxane	Water
Cooling Water	3/29/22	Urgent	1,4-Dioxane	Water
FFCQC-1a	3/29/22	Urgent	1,4-Dioxane	Water
FFCQC-2a	3/29/22	Urgent	1,4-Dioxane	Water
FFCQC-3a	3/29/22	Urgent	1,4-Dioxane	Water
Outfall 001	3/29/22	Urgent	1,4-Dioxane	Water
Outfall 001	3/29/22	Urgent	1,4-Dioxane	Water
NSW-1a	3/29/22	Standard	1,4-Dioxane	Water
NSW-2a	3/29/22	Standard	1,4-Dioxane	Water

Upon receipt samples were scheduled for the following analysis:
 Analysis
 • 1,4-Dioxane (USEPA 1624) - Urgent TAT
 • 1,4-Dioxane (USEPA 1624) - Standard TAT
 • 8 Samples + 1 Matrix Spike + 1 Matrix Spike Duplicate
 • 2 Samples

Sample Receipt, Chain of Custody Records, and Holding Times
 Samples were delivered directly to AT&S by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample conditions and anomalies, if any, are either presented in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exceptions:
 • None

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written standard operating procedure (SOP) specific to the AT&S Laboratories, as required by USEPA. All data are peer and management reviewed to ensure compliance with the above referenced SOP's and project specifications. In addition, all data conform to the laboratory's Quality Assurance / Quality Control Manual.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB), LRBs, fortified blanks (BS, LFB, LCS), matrix spikes (MS, SPK), and duplicates whether spiked or native (MSD, SPK DUP, DUP, LK).

The following are qualifier descriptions that may be used throughout this SDG and are presented with their associated samples in each SDG section as appropriate.

- "E" - exceeds the calibration range of the method
- "D" - result taken from sample dilution
- "P" - concentration reported between the laboratory/instrument determined Method Detection Limit (MDL)/Limit Of Detection (LOD), and the Practical Quantitation Limit (PQL)/Limit Of Quantitation (LOQ)
- "MDL" - concentration reported below the laboratory/instrument Method Detection Limit (MDL)/Limit Of Quantitation (LOQ) and the instrument Signal To Noise Ratio (SNR) of approximately 10:1
- "L" - analyte concentration in method blank exceeds reporting limit
- "LF" - analyte not detected above MDL / LOD
- "**" - indicates matrix has exceeded batch or sample specific QA/QC control limits
- "M" - indicates matrix interference
- "T" - indicates ion ratio between 15 and 30 % acceptance window
- "N" - indicates ion ratio outside 20% acceptance window and result is Not Reported

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB), LRBs, fortified blanks (BS, LFB, LCS), matrix spikes (LFB, MS, SPK), and duplicates whether spiked or native (LFB, MSD, SPK DUP, DUP, LK).

Data Deliverables

This data package constitutes a Level II package; other data report packages (Level I, Level IV DWP, EPA IS EDD) are available upon request. There were no hardcopy data summary sheets generated for this project.

Sample Analysis

1,4-Dioxane Analysis (GC/MS): Samples were analyzed by purge and trap GC/MS in accordance with USEPA method 824 (Volatile Organic Compounds by Sorption Dilution Gas Chromatography - Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 1,4-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Anomalies Found:
 • None



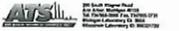


ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY BLANK SUMMARY

Table with columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Field, Units, Basis, Method Detection Limit, Reporting Detection Limit, Quatifier. Includes data for LFB-1 3/19/22.

Comments: All Matrix Spikes (MS) and Matrix Spike Duplicates (MSD) were analyzed as part of the QA/QC batch. The MS/MSDT met the precision acceptance criteria with the following exceptions:



CHAIN OF CUSTODY RECORD

Table for Chain of Custody Record with columns for Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Field, Units, Basis, Method Detection Limit, Reporting Detection Limit, Quatifier. Includes handwritten signatures and dates.

* - Requested Turn-Around Time Priority Number Key: 1 = Urgent 2 = Rush 3 = Standard

PRECISION
Matrix Spikes and Matrix Spike Duplicates - Precision

A matrix spike (MS) and matrix spike duplicate (MSD) were analyzed as part of the QA/QC batch. The MS/MSDT met the precision acceptance criteria with the following exceptions:

Signature: Mark T. DeLong (Quality Assurance Coordinator) dated April 4, 2022. Signature: Philip B. Simon (Laboratory Director) dated April 4, 2022.

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ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY PRECISION SUMMARY

Table with columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Field, Units, Basis, Method Detection Limit, Reporting Detection Limit, Quatifier. Includes data for LFB-1 3/19/22.

Comments: All Matrix Spikes (MS) and Matrix Spike Duplicates (MSD) were analyzed as part of the QA/QC batch. The MS/MSDT met the precision acceptance criteria with the following exceptions:



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Table with columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Basis, Percent Recovery, LCL, UCL, Quatifier. Includes data for LFB-1 3/19/22.

Comments: All Matrix Spikes (MS) and Matrix Spike Duplicates (MSD) were analyzed as part of the QA/QC batch. The MS/MSDT met the precision acceptance criteria with the following exceptions:



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Table with columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Basis, Percent Recovery, LCL, UCL, Quatifier. Includes data for LFB-1 3/19/22.

Comments: All Matrix Spikes (MS) and Matrix Spike Duplicates (MSD) were analyzed as part of the QA/QC batch. The MS/MSDT met the precision acceptance criteria with the following exceptions:



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Table with columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Basis, Percent Recovery, LCL, UCL, Quatifier. Includes data for LFB-1 3/19/22.

Comments: All Matrix Spikes (MS) and Matrix Spike Duplicates (MSD) were analyzed as part of the QA/QC batch. The MS/MSDT met the precision acceptance criteria with the following exceptions:

Sample Dilutions
Samples containing compounds at concentrations above the initial calibration curve were diluted and reanalyzed for these compounds. The following samples were diluted for 1:4 dilution:

- 1810-24-17922
- 1810-24-17922
- 1810-24-17922

Laboratory Reference Blanks
A laboratory reference blank (LRB) was analyzed as part of the QA/QC batch. The LRB met the acceptance criteria with the following exceptions:

- None

Internal Standards and Surrogates - Quantitation
This method utilizes internal standards only, not surrogates. Internal standards were used and quantitation was performed with the following exceptions:

- None

Laboratory Fortified Blanks (LFB) / Laboratory Control Samples (LCS) / On-Going Precision and Accuracy (OPR)
A laboratory fortified blank (LFB) was analyzed as part of the QA/QC batch. The LFB/OPR met the precision acceptance criteria with the following exceptions:

- None

080-002-2574_07/2021.doc

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written standard operating procedure (SOP) specific to the ATS Laboratory, as required by USEPA. All data are peer and management reviewed to ensure compliance with the above referenced SOPs and project specifications. In addition, all data conform to the laboratory's Quality Assurance/Quality Control Manual.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MBL, LMB), fortified blanks (IS, LFB, LCS), matrix spikes (MS, SPK), and duplicates (whether spiked or native) (MSD, SPK DUP, LFB, LRS).

Data Qualifications, Specifications, and Technical Narration

The following are qualifier descriptions that may be used throughout this SDG and are presented with their associated samples in each SDG section as appropriate.

- "E" - exceeds the calibration range of the method
- "D" - result taken from sample dilution
- "T" - concentration reported between the laboratory/instrument determined Method Detection Limit (MDL)/Limit of Detection (LOD), and the Practical Quantitation Limit (PQL)/Limit of Quantitation (LOQ)
- "IMDL" - concentration reported below the laboratory/instrument Method Detection Limit (MDL)/Limit of Quantitation (LOQ) and the instrument Signal To Noise Ratio (SNR) of approximately 10:1
- "L" - analyte not detected above MDL / LOD
- "**" - indicates analyte has exceeded batch or sample specific QA/QC control limits
- "M" - indicates matrix interference
- "**" - indicates ion ratio between 15 and 30% acceptance window
- "N" - indicates ion ratio outside 30% acceptance window and result is Not Reported

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MBL, LMB), fortified blanks (IS, LFB, LCS), matrix spikes (LPM, MS, SPK), and duplicates (whether spiked or native) (LPM, MSD, SPK DUP, DUP, LRS).

Data Deliverables

This data package contains a Level II package; other data report packages (Level I, Level IV DVP, EPA RS ESD) are available upon request. There were no hardcopy data summary sheets generated for this project.

Sample Analysis

1,4-Dioxane Analysis (GC/MS): Samples were analyzed by purge and trap GC/MS in accordance with USEPA method 1631 (Volatile Organic Compounds) by Isotope Dilution Gas Chromatography - Mass Spectrometry. An initial calibration with at least five levels was used to quantitate 1,4-Dioxane. Samples were reported to project specific reporting limits. Samples were reported in mg/L.

Anomalies Noted:

- None

Data Transmittal Cover Page

Project Name: Pali Corporation
 ATS Project Number: G001-002
 ATS Report Number(s): Inorg. SRF_0330221
 Client PO Number: 4505179649
 Project Description: This data report contains the results of 8 water samples, received by ATS on March 30, 2022 to be analyzed for 1,4-Dioxane.

ORGANIC ANALYSIS
1,4-Dioxane by GC/MS
USEPA 1624

ATS Project Number: G001-002
 Report Date: 4/4/22
 SRF / SDG Number(s): 0330221
 Client PO Number: 4505179649

Case Narrative Summary

This case narrative applies to the following 8 samples that were received at Ann Arbor Technical Services, Inc. (ATS) on 3/30/22, and associated matrix-specific QA/QC:

Sample	Client Sample Identification	Sample Date	Requested Turn Around Time	Analysis	Matrix
Reagent	3/30/22				
Outfall 061	3/30/22	Urgent	1,4-Dioxane	Water	
Bed Pond	3/30/22	Urgent	1,4-Dioxane	Water	
Combination Effluent	3/30/22	Urgent	1,4-Dioxane	Water	
JP-1	3/30/22	Urgent	1,4-Dioxane	Water	
Outfall Creek	3/30/22	Urgent	1,4-Dioxane	Water	
MW-17	3/30/22	Standard	1,4-Dioxane	Water	
MW-96a	3/30/22	Standard	1,4-Dioxane	Water	
S095 Jackson Rd	3/30/22	Standard	1,4-Dioxane	Water	

Upon receipt samples were scheduled for the following analysis:

- Analysis
- 1,4-Dioxane (USEPA 1624) - Urgent TAT
 - 1,4-Dioxane (USEPA 1624) - Standard TAT
 - 3 Samples + 1 Matrix Spike + 1 Matrix Spike Duplicate
 - 3 Samples

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pali Corporation staff. Samples were received with proper chain of custody records included. Sample conditions and anomalies, if any, are either presented in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exceptions:

- None

We certify that the sample analysis for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratory, as required by USEPA. Laboratory data sheets, SOPs, and QA/QC information are available for inspection and audit at the Laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

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 Susan Chumel (Lab Manager) FAX Number: 734-995-3731

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 Katie Strohauser (kstrohauser@tvs.com), woods@iv-operations.com, Peters, Sue (sue_peters@pali.com)
 Amanda Isabella (amanda_isabella@pali.com)

Date: 4/4/22 Signed: *[Signature]*

ATS Project Number: G001-002.22
 ATS SDG: 0330221

Prepared By:
 Ann Arbor Technical Services, Inc.
 290 South Wagner Road
 Ann Arbor, MI 48103

G001-002.22/CN_0330221_06

Consultant in Chemistry & Environmental Services
 290 South Wagner Road, Ann Arbor, Michigan 48103 Tel 734-995-0995 Fax 734-995-3731

G001-002.22/CN_0330221_06



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Sample Dilutions

Samples containing compounds at concentrations above the initial calibration curve were diluted and reanalyzed for those compounds. The following samples were diluted for 1,4-Dioxane:

- Bed Pond 3/30/22
- MW-17 3/30/22
- MW-96a 3/30/22

Laboratory Reagent Blanks

A laboratory reagent blank (LRB) was analyzed as part of the QA/QC batch. The LRB met the acceptance criteria with the following exceptions:

- None

Internal Standards and Surrogates - Qualification

This method utilizes Internal Standards only, not Surrogates. Internal standards exist and retention times met the acceptance criteria with the following exceptions:

- None

ACCURACY

Laboratory Fortified Blanks (LFB/OPR) Laboratory Control Samples - Accuracy

A laboratory fortified blank (LFB/OPR) was analyzed as part of the QA/QC batch. The LFB/OPR met the acceptance criteria with the following exceptions:

- None

Matrix Spikes and Matrix Spike Duplicates - Accuracy

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD met the accuracy acceptance criteria with the following exceptions:

- None

PRECISION

Matrix Spike and Matrix Spike Duplicates - Precision

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD met the precision acceptance criteria with the following exceptions:

- None

[Signature]
 / April 4, 2022
 Mark T. DeLong (Quality Assurance Coordinator)

[Signature]
 / April 4, 2022
 Philip B. Simon (Laboratory Director)

G001-002.22/CN_0330221_06



G001-002.22/CN_0330221_06



Chain of Custody Record

Sample ID	Client Name	Sample Description	Request Date	Analysis Date	Analysis Time	Analysis Location	Analysis Method	Analysis Results	Analysis Unit	Analysis Status	Analysis Comments
1	ATS	Reagent	3/30/22								
2	ATS	Outfall 061	3/30/22								
3	ATS	Bed Pond	3/30/22								
4	ATS	Combination Effluent	3/30/22								
5	ATS	JP-1	3/30/22								
6	ATS	Outfall Creek	3/30/22								
7	ATS	MW-17	3/30/22								
8	ATS	MW-96a	3/30/22								
9	ATS	S095 Jackson Rd	3/30/22								

ANN ARBOR TECHNICAL SERVICES, INC.
 QUALITY ASSURANCE/QUALITY CONTROL SUMMARY
 LABORATORY BLANK SUMMARY

Form 1

Requested Turn Around Time Priority Number Ref: 1 = Urgent 2 = Rush 3 = Standard

Chain of Custody Record

Project Name: G001-002.22
 Client Name: Pali Corporation
 Project Number: 4505179649
 Report Date: 4/4/22
 Analysis Date: 4/4/22
 Analysis Time: 12:00 PM
 Analysis Location: 300 South Wagner Road
 Analysis Method: GC/MS
 Analysis Results: 1,4-Dioxane
 Analysis Unit: mg/L
 Analysis Status: Complete
 Analysis Comments: None



Method	US EPA Test	Client Name	Sample ID	Sample Type	Sample Date	Sample Location	Sample Matrix	Sample Volume	Sample Temp	Sample Time	Sample Status	Sample Result	Sample Units	Sample Range	Sample Accuracy	Sample Precision
Method 8210	US EPA Test	Client Name	Sample ID	Sample Type	Sample Date	Sample Location	Sample Matrix	Sample Volume	Sample Temp	Sample Time	Sample Status	Sample Result	Sample Units	Sample Range	Sample Accuracy	Sample Precision



Method	US EPA Test	Client Name	Sample ID	Sample Type	Sample Date	Sample Location	Sample Matrix	Sample Volume	Sample Temp	Sample Time	Sample Status	Sample Result	Sample Units	Sample Range	Sample Accuracy
Method 8210	US EPA Test	Client Name	Sample ID	Sample Type	Sample Date	Sample Location	Sample Matrix	Sample Volume	Sample Temp	Sample Time	Sample Status	Sample Result	Sample Units	Sample Range	Sample Accuracy



Method	US EPA Test	Client Name	Sample ID	Sample Type	Sample Date	Sample Location	Sample Matrix	Sample Volume	Sample Temp	Sample Time	Sample Status	Sample Result	Sample Units	Sample Range	Sample Accuracy
Method 8210	US EPA Test	Client Name	Sample ID	Sample Type	Sample Date	Sample Location	Sample Matrix	Sample Volume	Sample Temp	Sample Time	Sample Status	Sample Result	Sample Units	Sample Range	Sample Accuracy



Method	US EPA Test	Client Name	Sample ID	Sample Type	Sample Date	Sample Location	Sample Matrix	Sample Volume	Sample Temp	Sample Time	Sample Status	Sample Result	Sample Units	Sample Range	Sample Accuracy
Method 8210	US EPA Test	Client Name	Sample ID	Sample Type	Sample Date	Sample Location	Sample Matrix	Sample Volume	Sample Temp	Sample Time	Sample Status	Sample Result	Sample Units	Sample Range	Sample Accuracy

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Wisconsin Laboratory ID: 98051726



Data Transmittal Cover Page

Project Name: Pall Corporation
 ATS Project Number: G001-002
 Inorg_SRF_0401221
 Client PO Number: 4505179640
 Project Description: This data report contains the results of 10 water samples, received by ATS on April 1, 2022 to be analyzed for 1,4-Dioxane.

We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratories, as required by USEPA. Laboratory data sheets, SOPs, and QA/QC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Gage Trendel
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 Director Chemical Lab Manager
 FAX Number: 734-995-3731

Additional Message: Copy report to: Paterson, Keith (keith.paterson@pall.com), Brody, Jim (jim_brody@pall.com), Katie Strohbecher (katie.strohbecher@hwy.com), woods@tv-operations.com, Paters, Sue (sue.paters@pall.com), Amanda Isabella (amanda_isabella@pall.com)

Date: 4/1/22
 Signed:

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LABORATORY OPERATIONS
CASE NARRATIVE

ATS Project Number: G001-002
 Report Date: 4/4/22
 SRF / SDG Number(s): 0401221
 Client PO Number: 4505179649

This case narrative applies to the following 10 samples that was received at Ann Arbor Technical Services, Inc. (ATS) on 4/1/22, and associated matrix-specific QA/QC.

Client Sample Identification	Sample Date	Requested Turn Around Time	Analysis	Matrix
Red Pond	3/31/22	Urgent	1,4-Dioxane	Water
Grab	3/31/22	Urgent	1,4-Dioxane	Water
Chualar	3/31/22	Urgent	1,4-Dioxane	Water
Red Pond	4/1/22	Urgent	1,4-Dioxane	Water
PF6-OC-1a	4/1/22	Urgent	1,4-Dioxane	Water
PF6-OC-2a	4/1/22	Urgent	1,4-Dioxane	Water
Grab	4/1/22	Urgent	1,4-Dioxane	Water
197 South Wagner Rd.	3/31/22	Standard	1,4-Dioxane	Water
MWC-2a	3/31/22	Standard	1,4-Dioxane	Water
MWC-5a	3/31/22	Standard	1,4-Dioxane	Water

Upon receipt samples were subsampled for the following analyses.

- Analysis
- Number of Samples
- 1,4-Dioxane (USEPA 1624) - Urgent TAT • 7 Samples + 1 Matrix Spike + 1 Matrix Spike Duplicate
- 1,4-Dioxane (USEPA 1624) - Standard TAT • 3 Samples

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample condition and anomalies, if any, are either presented in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exceptions.

- None

G001-002-22\G001-002-221.doc
 Submitted to Chemistry & Environmental Science
 230 South Wagner Road, Ann Arbor, Michigan 48103 Tel 734-995-0200 Fax 734-995-3731

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written standard operating procedure (SOP) specific to the ATS Laboratory, as required by USEPA. All data are peer and management reviewed to ensure compliance with the above referenced SOPs and project specifications. In addition, all data conform to the laboratory's Quality Assurance / Quality Control Manual.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB), fortified blanks (FB, LFR, LCS), matrix spikes (MS, SPK), and duplicates (whether spiked or native (MSD, SPK DUP, DUP, LR)).

Data Qualifications, Specifications, and Technical Narration

- The following are qualifier descriptions that may be used throughout this SDG and are presented with their associated samples in each SDG section as appropriate.
- "E" - exceeds the calibration range of the method.
- "D" - result taken from sample dilution.
- "P" - concentration reported between the laboratory/instrument determined Method Detection Limit (MDL)/Limit of Detection (LOD), and the Practical Quantitation Limit (PQL)/Limit of Quantitation (LOQ).
- "MDL" - concentration reported below the laboratory/instrument Method Detection Limit (MDL)/Limit of Quantitation (LOQ) and the instrument Signal To Noise Ratio (SNR) of approximately 10:1.
- "L" - analyte concentration in method blank exceeds reporting limit.
- "LP" - analyte not detected above MDL / LOD.
- "M" - indicates analyte has exceeded batch or sample specific QA/QC control limits.
- "MI" - indicates matrix interference.
- "R" - indicates ion ratio between 15 and 30% acceptance window.
- "NR" - indicates ion ratio outside 30% acceptance window and result is Not Reported.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB), fortified blanks (FB, LFR, LCS), matrix spikes (LPM, MS, SPK), and duplicates (whether spiked or native (LPM, MSD, SPK DUP, DUP, LR)).

Data Deliverables

This data package constitutes a Level II package, other data report packages (Level I, Level IV DVP, EPA RI EDO) are available upon request. There were no hardcopy data summary sheets generated for this project.

Sample Analysis

1,4-Dioxane Analysis (GC/MS): Samples were analyzed by purge and trap GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Sorbent Tube Gas Chromatography - Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 1,4-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analyst Initials:
 • Name





ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY BLANK SUMMARY

Method: USEPA 1631
QA/QC Batch Number: QOC09041221
SOP: 041221
Project Number: 0001-002.22
Report Date: 4/4/2022

Laboratory Reagent Blank (LRB) / Method Blank (MB)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Result, Units, Basis, Method Detection Limit, Reporting Detection Limit, Qualifier. Row 1: LRB-14122, 04/1/2022, 12:10:30, 1,4-Dioxane, 12397-1, N/A, N/A, N/A, N/A, N/A, N/A

Comments: All method blanks (MB) contain a blank (0) result. Calculations performed per SOP 041221. Project work is verified by the analyst. All values are based on the blank (0) result.



CHAIN OF CUSTODY RECORD

Chain of Custody Record table with columns for Date, Time, Location, and Name. Includes handwritten entries for sample collection and analysis.

PRECISION
Matrix Spike and Matrix Spike Duplicate - Precision
A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD must meet the precision acceptance criteria with the following exceptions:
• None

Mark T. DeLong (Quality Assurance Coordinator)
Philip H. Simon (Laboratory Director)



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY PRECISION SUMMARY

Method: USEPA 1631
QA/QC Batch Number: QOC09041221
SOP: 041221
Project Number: 0001-002.22
Report Date: 4/4/2022

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Result, Units, Basis, Method Detection Limit, Reporting Detection Limit, Qualifier. Row 1: MS-1218-MSD, 04/1/2022, 01:18:27, 1,4-Dioxane, 12397-1, 0.0170, mg/L, Wet, 1.4, 0.06, 23

Comments: All method blanks (MB) contain a blank (0) result. Calculations performed per SOP 041221. Project work is verified by the analyst. All values are based on the blank (0) result.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method: USEPA 1631
QA/QC Batch Number: QOC09041221
SOP: 041221
Project Number: 0001-002.22
Report Date: 4/4/2022

Matrix Spike Duplicate (MSD)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Basis, Percent Recovery, LCL, UCL, Qualifier. Row 1: MS-1218-MSD, 04/1/2022, 01:18:24, 1,4-Dioxane, 12397-1, 0.0170, 0.0170, 0.0170, mg/L, Wet, 100, 80, 120, 122

Comments: All method blanks (MB) contain a blank (0) result. Calculations performed per SOP 041221. Project work is verified by the analyst. All values are based on the blank (0) result.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method: USEPA 1631
QA/QC Batch Number: QOC09041221
SOP: 041221
Project Number: 0001-002.22
Report Date: 4/4/2022

Matrix Spike (MS)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Basis, Percent Recovery, LCL, UCL, Qualifier. Row 1: MS-1218-MS, 04/1/2022, 01:18:27, 1,4-Dioxane, 12397-1, 0.0170, 0.0170, 0.0170, mg/L, Wet, 100, 80, 120, 122

Comments: All method blanks (MB) contain a blank (0) result. Calculations performed per SOP 041221. Project work is verified by the analyst. All values are based on the blank (0) result.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY

Method: USEPA 1631
QA/QC Batch Number: QOC09041221
SOP: 041221
Project Number: 0001-002.22
Report Date: 4/4/2022

Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS) / On-Going Precision and Accuracy (OPR)

Table with 10 columns: Lab Sample ID, Analysis Date, Analysis Time, Chemical Name, CAS, Sample Concentration, Spike Added, Measured Concentration, Units, Basis, Percent Recovery, LCL, UCL, Qualifier. Row 1: LFB-14122, 04/1/2022, 11:10:40, 1,4-Dioxane, 12397-1, 0.010, 0.010, 0.010, mg/L, Wet, 112, 85, 115

Comments: All method blanks (MB) contain a blank (0) result. Calculations performed per SOP 041221. Project work is verified by the analyst. All values are based on the blank (0) result.

Sample Blanks
Samples containing components at concentrations above the initial calibration curve were diluted and reanalyzed for these components. The following samples were diluted for 1:10 dilution:
• MPA-25-10/122
• MPA-25-10/122
• MPA-58-10/122

Laboratory Reagent Blanks
A laboratory reagent blank (LRB) was analyzed as part of the QA/QC batch. The LRB met the acceptance criteria with the following exceptions:
• None

Internal Standards and Spike Recovery - Quantification
The internal standards and spike recovery were analyzed and met the acceptance criteria with the following exceptions:
• None

ACCURACY
Laboratory Fortified Blanks (LFB) / Laboratory Control Sample - Accuracy
A laboratory fortified blank (LFB) was analyzed as part of the QA/QC batch. The LFB/OPR met the acceptance criteria with the following exceptions:
• None

Matrix Spike and Matrix Spike Duplicate - Accuracy
A matrix spike (MS) and matrix spike duplicate (MSD) were analyzed as part of the QA/QC batch. The MS/MSD met the accuracy acceptance criteria with the following exceptions:
• None





1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	0201-002-22	Percent Moisture	100.0
ATS SSG Number	0461221	Substrate	2.1000
Client Sample ID	1910-4	Subsample (mL)	0.000
Laboratory Sample ID	0461221-10	Final Volume (mL)	0.000
Matrix	Water	Division Factor	0.0
Sample Date	03/15/2022 8:45	Seals	Well
Analytical Method (USEPA)	USEPA 1631	Units	mg/L
Preparation Method (USEPA)	USEPA 1631	Preparation Date	04/16/2022
QC Batch Number	02010401221	Analyze Date	04/16/2022 10:34:41

Parameter	CASE	Result	MDL	PQL	Qual
1,4-Dioxane	123-91-1	0.3	0.06		M

COMMENTS
 All methods are subject to 10% variability unless otherwise noted.
 Calibration and recovery are required.
 Method blanks are required for 1631, 1632, 1631A.
 All 1631A samples require a 10% sample spike recovery check.

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